The OIL WEEKLY

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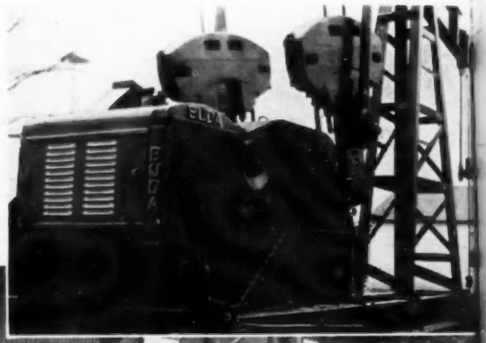

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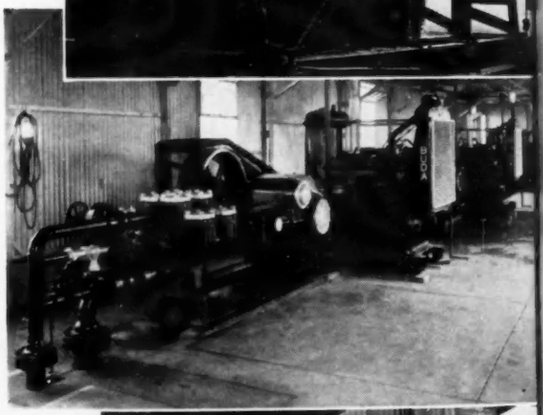

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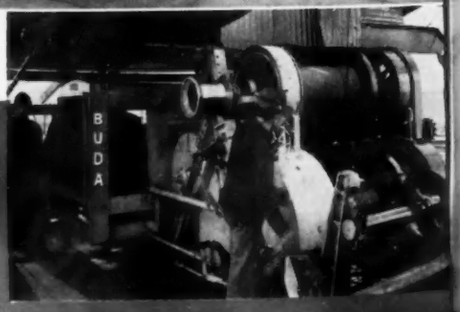


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## LOOKING AHEAD
*. . . with the Editor*

THE Tepetate field of Louisiana has established a unique record of having already produced a greater volume of oil than its estimated ultimate output would have been under conventional operating methods.

For this reason it is of interest and value to review the performance and operating practices in this field, which six years ago became the scene of the first of its kind of high-pressure field-stabilization, gasoline and pressure-maintenance plant operation. This interesting story will be told in a forthcoming article.

☆

### The Oil Man's Calendar

| | |
|---|---|
| APR. 28 | Natural Gas Management Conference, Under Auspices of Natural Gas Section, American Gas Association, Gibson Hotel, Cincinnati, Ohio. |
| 29–30 | American Petroleum Institute, Division of Production, Southwestern District, Rice Hotel, Houston. |
| MAY 5–6 | Petroleum Electrical Association, Houston. |
| 6–8 | American Institute of Mining and Metallurgical Engineers, Petroleum Division, Adolphus Hotel, Dallas, Texas. |
| 7–8 | Independent Petroleum Association of America, Mid-Year Meeting, Jefferson Hotel, St. Louis, Missouri. |
| 20–21 | A.P.I. Mid-Continent Section, Production Division, Tulsa. |
| 24–25 | Joint Production and Chemical Committee Conference, Sponsored by Technical Section of American Gas Association, Hotel Pennsylvania, New York. |


# THE OIL WEEKLY

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serious hazards exist in killing producing wells to effect recompletion.

4. The redistribution of market demand, as pointed out above, would create complicated transportation problems in some instances, resulting in more recovery in some areas than pipe lines could handle and at the same time would reduce production in some fields below line capacities.

5. There is no reason why allowables from existing wells cannot be increased where producing ability exists, thus making more oil available without expending any steel whatsoever.

6. Increased production resulting from higher allowables of dual-completed wells would discourage wildcatting and the discovery of new reserves. This would react adversely against this cardinal tenet of our present national policy.

7. Producing through tubing and annular space between tubing and casing would be inconsistent with engineering concept that a well should be allowed to produce only through tubing.

8. Difficulties would be encountered in artificially lifting from two zones.

9. The ability of packers to prevent commingling of fluids over long periods is questionable.

10. Increased hazard from sanding up and higher workover costs would result.

11. If one zone sands up, goes to water or fails to produce, it would be necessary to kill the well to work over the zone that failed. Consequently, ultimate recoveries as well as current production might be reduced.

**Reflecting the ingenuity of petroleum industry engineers and suppliers, the problems of material and manpower shortage and other troubles did not prevent a group of Houston oil men from successfully completing a 50-foot deep water irrigation well—and they now expect to have plenty of victory vegetables to eat this summer.**

**Justly proud of a community victory garden already in the early stages of vegetable production, the group set about to assure a supply of water. Designing their own rig and equipment, they successfully hand-rotated the hole to the producing formation 50 feet below the surface in two days' time.**

**C. W. DeLancey, Humble Oil & Refining Company, and Lewis Garfield, Hughes Tool Company, supervised the operation. The roughneck crew consisted of H. J. Craig and "Dutch" Brown of Baash-Ross Tool Company; A. Colston and Henry Peebles of Norvell-Wilder Supply Company, and J. E. Peters of Houston Oilfield Material Company.**

**Principal difficulty arose because Tool-Maker Garfield fashioned a left-hand bit, and the tendency of the crew to rotate the drill pipe in the wrong direction. Once the quick action of Toolpusher DeLancey in shutting off the circulating pumps (a rubber hose connected to a nearby residence's faucet) averted a twist-off. Despite rationing, a ladies auxiliary supplied coffee, and at times relieved the manpower question.**

## Unique Petroleum Shipping Methods

UNDER duress of war, some unique emergency petroleum railroad carriers are being developed.

One hundred cars formerly used as cement carriers are undergoing conversion to petroleum carriers, more than half of which are ready for use. These are steel gondolas equipped with large steel tanks. They will move fuel oil and kerosine, at least 12 million gallons a year, from Louisiana to Massachusetts.

Several types of lined box cars have been considered by ODT officials, and at least one type is actually being prepared at this time. So called Flexitanks, which are canvas balloons processed with a rubber substitute, are being installed in 50 steel automobile-type box cars. Difficulties in obtaining the necessary materials have delayed their preparation, but the first 10 are expected to be ready for service by the first of May. Still another variation of the lined box car is in the investigation stage. It is a standard automobile-type car fitted with four steel tanks encased in wooden boxes. An improved model of this car is being fitted with corrugated steel tanks, which will not have to be supported by wooden boxes.

Because of shortages of materials and the excessive costs involved, the Mareng cell car will not be built.

## Aviation Gasoline Nine Years Old

THE foundation for the tremendous fighting advantage which 100-octane gasoline is giving to the United States and Allied Nations air forces today was laid as long as nine years ago, when the War Department placed the first order in history for 1000 gallons of this fuel.

The original contract, dated March 8, 1934, called for fuel of "not less than 95-octane number," but actually Shell Oil Company delivered 100-octane fuel, the first ever produced in commercial quantity. This initial batch of high performance aviation gasoline was manufactured at Shell Point, California, and shipped to the Army Air Base at Wright Field, Ohio, where it was used in actual test flights.

# Declining Output of Illinois and Oklahoma Becomes Serious

**Output of these two states has fallen 100,000 barrels daily in past year, throwing heavy burden on other areas and complicating oil shipping problem. Whether nation can produce sufficient quantities to meet rising consumption by end of year depends to large extent on production trend in these two states, and the outlook is not encouraging**

By A. R. McTEE, Staff Writer

THE extremely sharp decline in the crude producing rate of Oklahoma and Illinois is greatly aggravating prospects that the United States may not be able to produce sufficient crude oil to meet rising war consumption by the end of the year. The daily output of these two states today is more than 100,000 barrels under their level of a year ago, and continues downward. During the first quarter of 1942, the combined production of the two states was 44,000 barrels below the daily average recovery during the preceding three months. This decrease throws a heavy burden upon other oil states, which must not only meet accelerating consumption but also must offset the drastic drop in Oklahoma and Illinois production. The loss of production in Oklahoma and Illinois also materially complicates the problem of moving available production and products to the East Coast.

To a large extent the question of whether the nation will reach the end of the year with the ability to produce sufficient quantities to fill demands depends upon the future production trend of these two states.

If they continue to decline as sharply as in the past 12 months, the situation will be critical. Prospects are not encouraging, for nothing indicates an improvement in the position of either of the states. Because their current rate of decline remains sharp, and because they had very unsatisfactory exploratory results during 1942, continued lower production levels are indicated. The situation is made more acute by the fact that they cannot make up further losses in production by drawing on storage. They did this during 1942, taking approximately 9½ million barrels from stocks during the past 12 months, and consequently their volume of oil in storage has waned to quite low levels.

During the first quarter of 1943 the combined output of these two states was 171,000 barrels a day less than a year previous. They produced at a daily rate of 581,560 barrels during the first three months of this year, in contrast with 752,600 barrels a day during the first quarter of 1942. Illinois during the year under study dropped 114,000 barrels daily, while Oklahoma was losing 57,000 barrels per day.

As a result of the lower production rate in Oklahoma and Illinois, the daily output of PAW's District 2 (Kansas, Indiana, Michigan, Nebraska, Kentucky and Ohio in addition to Oklahoma and Illinois) has dropped nearly 110,000 barrels during the past year. Kansas, Oklahoma and Illinois are the only states in District 2 which produce more than 100,000 barrels daily, together accounting for nine tenths of the district production, and hence are pivotal in their influence on output. Other states in the territory produce such minor volumes (25,000 barrels or less per day) that they are unimportant. Only Kansas, the third large producing state of the district, has been able to assist in offsetting the decline, and with limited pipeline facilities this state has increased its daily output only 60,000 barrels daily during the past year. Furthermore, there are many who believe Kansas is now producing at close to its maximum rate and can be expected to yield but slightly additional quantities.

### Burden on Texas

Therefore, prospects are that District 2 will continue to produce at lower rates as long as Illinois and Oklahoma continue dropping so rapidly. Of necessity, then, the nation must look elsewhere for oil to supplant whatever decline that may occur. Unfortunately, no area as well located geographically can produce more oil. The nation has no choice

**TABLE 1**
**Trend of District 2 Crude Production and Stocks**
(All figures in barrels)

| State and Period | Daily Average Crude Production | | | Crude Stocks End of Period | | |
|---|---|---|---|---|---|---|
| | 1941 | 1942 | 1943 | 1941 | 1942 | 1943 |
| **Illinois** | | | | | | |
| First Quarter | 330,400 | 352,200 | 238,130 | 14,348,000 | 12,198,000 | 9,297,000 |
| Second Quarter | 342,230 | 292,430 | ..... | 13,827,660 | 11,064,660 | ..... |
| Third Quarter | 354,330 | 270,460 | ..... | 13,830,000 | 9,199,660 | ..... |
| Fourth Quarter | 408,100 | 257,600 | ..... | 12,665,000 | 9,337,000 | ..... |
| **Kansas** | | | | | | |
| First Quarter | 199,700 | 242,430 | 302,130 | 9,472,330 | 8,837,330 | 7,918,000 |
| Second Quarter | 216,130 | 255,230 | ..... | 9,180,660 | 8,580,660 | ..... |
| Third Quarter | 243,900 | 272,560 | ..... | 9,030,000 | 9,242,330 | ..... |
| Fourth Quarter | 252,260 | 291,430 | ..... | 8,612,000 | 8,872,660 | ..... |
| **Oklahoma** | | | | | | |
| First Quarter | 420,230 | 400,400 | 343,430 | 49,804,000 | 38,003,330 | 31,474,000 |
| Second Quarter | 418,260 | 394,460 | ..... | 47,111,660 | 38,450,000 | ..... |
| Third Quarter | 433,400 | 382,830 | ..... | 41,346,660 | 36,083,330 | ..... |
| Fourth Quarter | 424,100 | 367,960 | ..... | 39,231,660 | 32,365,660 | ..... |
| **Others** | | | | | | |
| First Quarter | 20,140 | 22,440 | 24,420 | 3,899,830 | 4,139,660 | 3,270,000 |
| Second Quarter | 19,580 | 26,460 | ..... | 3,851,830 | 3,760,240 | ..... |
| Third Quarter | 21,060 | 25,540 | ..... | 3,832,240 | 3,228,240 | ..... |
| Fourth Quarter | 24,270 | 25,280 | ..... | 3,661,580 | 2,960,820 | ..... |
| **District Total** | | | | | | |
| First Quarter | 970,470 | 1,017,470 | 908,110 | 77,524,160 | 63,178,320 | 51,959,000 |
| Second Quarter | 996,200 | 968,580 | ..... | 73,971,810 | 61,855,560 | ..... |
| Third Quarter | 1,052,690 | 951,390 | ..... | 68,038,900 | 57,753,560 | ..... |
| Fourth Quarter | 1,108,730 | 942,270 | ..... | 64,160,240 | 53,536,140 | ..... |

Production figures from Bureau of Mines monthly reports, except for first quarter of 1943, which has been calculated from American Petroleum Institute weekly reports. Crude stock figures from Bureau of Mines weekly reports, with the first quarter of 1943 ending with March 27.

**TABLE 2**
**Trend of District 2 Reserves and Discovery Rates**
(All figures in barrels)

| State and Year | Annual Crude Production | DISCOVERY RATE | | Crude Reserves Remaining End of Year |
|---|---|---|---|---|
| | | Oil Found in Year | Difference in Volume Found and Produced | |
| **Illinois** | | | | |
| 1938 | 23,929,000 | 208,064,000 | +184,135,000 | 242,847,000 |
| 1939 | 94,302,000 | 233,091,000 | +138,789,000 | 381,636,000 |
| 1940 | 146,788,000 | 80,457,000 | — 65,831,000 | 315,305,000 |
| 1941 | 134,138,000 | 152,547,000 | + 18,409,000 | 333,714,000 |
| 1942 | 106,456,000 | 79,520,000 | — 26,936,000 | 306,778,000 |
| **Kansas** | | | | |
| 1938 | 59,587,000 | 65,800,000 | + 6,211,000 | 613,230,000 |
| 1939 | 60,723,000 | 172,960,000 | +112,237,000 | 725,467,000 |
| 1940 | 66,270,000 | 32,891,000 | — 33,379,000 | 692,270,000 |
| 1941 | 83,261,000 | 80,968,000 | — 2,293,000 | 689,795,000 |
| 1942 | 97,636,000 | 94,816,000 | — 2,820,000 | 686,975,000 |
| **Oklahoma** | | | | |
| 1938 | 174,882,000 | 26,600,000 | —158,282,000 | 1,162,370,000 |
| 1939 | 160,072,000 | 60,854,000 | — 99,118,000 | 1,063,152,000 |
| 1940 | 155,952,000 | 94,709,000 | — 61,243,000 | 1,001,909,000 |
| 1941 | 154,759,000 | 188,670,000 | + 33,911,000 | 1,035,820,000 |
| 1942 | 140,690,000 | 73,797,000 | — 66,893,000 | 968,927,000 |
| **Others** | | | | |
| 1938 | 29,299,000 | 21,430,000 | — 7,869,000 | 112,683,000 |
| 1939 | 32,979,000 | 61,316,000 | + 28,337,000 | 141,020,000 |
| 1940 | 33,169,000 | 11,514,000 | — 21,655,000 | 119,565,000 |
| 1941 | 31,097,000 | 63,879,000 | + 32,782,000 | 152,347,000 |
| 1942 | 36,512,000 | 49,455,000 | + 12,943,000 | 165,290,000 |
| **District Total** | | | | |
| 1938 | 287,697,000 | 321,894,000 | + 24,195,000 | 2,131,130,000 |
| 1939 | 348,076,000 | 528,221,000 | +180,245,000 | 2,311,275,000 |
| 1940 | 402,179,000 | 219,571,000 | —182,108,000 | 2,129,049,000 |
| 1941 | 403,255,000 | 486,064,000 | + 82,809,000 | 2,211,676,000 |
| 1942 | 381,294,000 | 297,588,000 | — 83,706,000 | 2,127,970,000 |

Data based upon American Petroleum Institute reports.

but to turn to Texas for additional supplies.

With the latter state to be called upon to furnish all the supplies for the 300,000-barrel-per-day 24-inch pipe line and also for the 200,000-barrel-daily 20-inch product line, the decline in Oklahoma-Illinois output places an exceptionally heavy burden and responsibility upon Texas. The state must not only furnish the supplies for these two important new carriers, but also make up for the loss in Oklahoma and Illinois if national production is to meet essential demand.

The decline in Oklahoma and Illinois is especially unfortunate because their pipe lines to the East have been enlarged during the past year. To take advantage of the shipping capacity they afford, arrangements must be made to move oil into Oklahoma from Texas so it can enter these systems. Because the newly proposed pipe line of Stanolind Pipe Line Company from West Texas to Oklahoma would make it possible to supply all the major transportation companies with additional supplies, it appears to be an essential war project.

During the first quarter of 1942, District 2 was producing 1,017,470 barrels of oil per day. This was slightly lower than its output in the fourth quarter of 1941, when it was producing 1,108,730 barrels per day. Since that time the decline in output has been steady, and during the first three months of 1943 the territory recovered but 908,110 barrels per day. Thus District 2 is producing 109,360 barrels less per day now than a year ago, despite efforts to maintain output. During this time, crude-oil stocks were reduced 11,219,320 barrels, or an average of 30,000 barrels daily. The end of March this year left the region with only 51,000,000 barrels of oil in storage.

A year ago Illinois produced 352,200 barrels daily during the first three months. Its output the first quarter of the current year had fallen to 238,130 barrels per day. Stocks of Illinois oil has been reduced nearly 2,901,000 barrels during the year, or almost 8000 barrels per day. At the end of March, 1943, only 9,297,000 barrels remained in storage. The situation has become so acute that local refineries are having difficulty in obtaining adequate crude supplies on which to operate. The outlook for production is not encouraging, the quantity of known crude reserves remaining in the state the end of 1942 being 74,858,000 barrels under their level four years ago, and 26,939,000 barrels of this deficiency occurred the past year despite the sharp drop in annual crude production. The volume of oil both found and developed in 1942, according to the American Petroleum Institute, was but half of that found and developed in the preceding year. If 152 million barrels of new oil found and developed in 1941 was not adequate to sustain production, what chance has 79 million barrels to check the drop in output?

Oklahoma produced 400,400 barrels daily during the first three months of 1941, but during the corresponding period of 1942 did only 343,430 barrels per day, and significantly 24,530 barrels of this 57,000-barrel loss occurred during the first quarter of the current year. Drafts on crude stocks in the state have been quite heavy, dropping from 38,002,330 barrels to 31,474,000 barrels during the year ended March 27, 1943. Oklahoma also has had a sharp drop in reserves. The first of this year it had remaining crude reserves amounting to 968,927,000 barrels, 66,893,000 barrels less than a year previous.

As mentioned previously, Kansas is the only state in the district that has shown an increase in production. During the past quarter output of this state was 10,700 barrels greater than in the preceding 3 months, yet stocks were reduced by 46,000 barrels, due to heavier demands to meet consumption.

Because the output of Oklahoma and Illinois will have such an important bearing on the nation's production picture, constant falling off of daily output is causing widespread concern, and pressure is being brought from many sources to apply a check.

The PAW production committee for District 2 recently decided that the downward curve throughout the region was attributable to both restrictions on drilling and development activities and to a shortage of manpower, with the latter factor perhaps the most serious now confronting operators. (During the first three months of 1943, Illinois completed only 1.6 percent fewer wells than in the corresponding period a year ago; but Oklahoma's completion rate was off 27.5 percent.)

The committee made specific recommendations to PAW that the ceiling price for crude oil be advanced 25 cents per barrel, and suggested the application of secondary-recovery methods as a means of increasing production. It went on record as also favoring a review of Conservation Order M-68 (now PAO-11) with reference to the district, especially as it applied to 40-acre spacing of wells. A majority of the committee's membership was of the opinion that more efficient operation of properties with increased production in certain areas would result from exceptions to the 40-acre spacing rule. Exceptions have been made to some extent in Illinois, and the committee feels that PAW would be justified in relaxing regulations if more oil could be obtained.

Meanwhile, the seriousness of the situation was considered at the recent meeting of the Interstate Oil Compact Commission in Wichita, and was a prime consideration in prompting the commission to pass a resolution asking President Roosevelt to issue a directive for an increase in crude-oil prices to stimulate drilling and exploration, to retard abandonment of stripper wells, to make possible secondary recovery, and to relieve critical material and manpower shortages.

# Wildcat Activity Declining Instead of Increasing

**Wildcatting results in first quarter reflect critical exploratory situation. Rate of completing exploratory tests indicate several hundred fewer wildcats likely in 1943 than last year, and to date a smaller percentage of completions have been productive**

By L. J. LOGAN, Associate Editor

WILDCATTING in the United States continues running far short of the levels regarded by the Petroleum Administrator for War as necessary to maintain the nation's ability to produce oil.

Instead of the sharp increase in wildcatting which the government has called for, there has been some letdown from the rates that prevailed in each of the past several years. The Office of Petroleum Administrator for War has called for completion of 4500 wildcats this year, but during March actual completions were on the basis of only about 2800 per year.

In the first quarter of this year only 723 wildcats were completed, including semi-wildcats—a rate of 2900 per year.

One fourth of this year having elapsed already, the prospect of reaching the goal of 4500 wildcats in 1943 grows more remote. And if the goal still is to be reached, there must be henceforth a very sharp increase in exploratory drilling. During each of the remaining 9 months of the year it would be necessary to drill 78 percent more wildcats than were completed in March. (During the 9 months 3777 wildcats would have to be completed in addition to the 723 so far drilled—an average of 420 per month against 236 in March.)

In the first 3 months of 1943 only 674 wildcats were completed exclusive of semi-wildcats, compared with 716 in the corresponding months of 1942, a decrease of 6 percent. Not only was drilling off but the percentage of productive tests was down also. Of the 674 wildcat completions so far this year (exclusive of semi-wildcats), only 102 (15.1%) were productive. Among the 716 completions in January-March last year 134 (18.7%) were productive. Almost as many new oil and distillate fields have been found this year as last year in the first quarter, but only one fourth as many new pays have been found. Meanwhile, there have been somewhat more gas field discoveries than last year.

March showed only a slight change in

### Results of Wildcatting in United States During March and to Date for Year

This report embraces approximately one full month's wildcatting, although not exact results for calendar month. It includes some wells completed in late February but omits some completed in late March.

| STATE OR DISTRICT | MONTHLY WILDCAT COMPLETIONS — Details for March, 1943 — Productive — New Fields *Oil | New Fields Gas | New Pays *Oil | New Pays Gas | Extensions *Oil | Extensions Gas | Unproductive Wildcats | Unproductive ‡Semi-Wildcats | Total Wildcats March 1943 | Total Wildcats Feb. 1943 | Total Wildcats March 1942 | CUMULATIVE WILDCATS COMPLETIONS: FIRST 3 MONTHS — Details for January-March, 1943 — Productive — New Fields *Oil | New Fields Gas | New Pays *Oil | New Pays Gas | Extensions *Oil | Extensions Gas | Unproductive Wildcats | Unproductive ‡Semi-Wildcats | Total Wildcats Jan.-Mar., 1943 | Total Wildcats Except Extensions or Semi-Wildcat Tests — Total 1943 | Total 1942 | Production 1943 | Production 1942 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Alabama | | | | | | | | | | | | | | | | | | | | | 2 | | | |
| Arkansas | | | 3 | | | | 4 | | 7 | 3 | 1 | 1 | | 3 | | 1 | | 6 | 1 | 12 | 10 | 5 | 5 | 3 |
| California | | | | | 2 | | 21 | | 23 | 13 | 7 | 1 | | 1 | | 2 | 1 | 51 | | 56 | 53 | 19 | 5 | 1 |
| Colorado | | | | | | | | | | 1 | | | | | | | | 1 | | 1 | 1 | | | |
| Georgia | | | | | | | | | | | | | | | | | | | | | | 1 | | |
| Illinois | 1 | 1 | | | 3 | | 20 | | 25 | 30 | 32 | 14 | 2 | | | 9 | | 65 | | 90 | 81 | 110 | 25 | 17 |
| Indiana | | | | | 1 | | 5 | | 6 | 7 | 4 | 2 | | | | 1 | | 23 | | 26 | 25 | 8 | 3 | 5 |
| Kansas | 7 | | 1 | | | | 19 | 3 | 30 | 33 | 27 | 12 | | 1 | | | | 84 | 3 | 100 | 97 | 86 | 13 | 17 |
| Kentucky | 2 | | | | | | 6 | | 8 | 1 | | 2 | | | | | | 11 | | 13 | 13 | | 2 | |
| Louisiana | 2 | 1 | 1 | | | | 5 | 1 | 10 | 14 | 18 | 4 | 1 | 2 | | | | 20 | 3 | 30 | 27 | 51 | 7 | 12 |
| North Louisiana | | 1 | | | | | 4 | | 5 | 9 | 10 | | 1 | | | | | 14 | 2 | 17 | 15 | 26 | 1 | 1 |
| South Louisiana | 2 | | 1 | | | | 1 | 1 | 5 | 5 | 8 | 4 | | 2 | | | | 6 | 1 | 13 | 12 | 25 | 6 | 11 |
| Michigan | 1 | | | | | | 11 | | 12 | 14 | 17 | 4 | 2 | | | 1 | | 32 | 4 | 43 | 38 | 39 | 7 | 3 |
| Mississippi | | | | | | | 1 | | 1 | 5 | 2 | 1 | | | | | | 5 | | 6 | 6 | 9 | 1 | |
| Missouri | | | | | | | 1 | | 1 | 1 | | 2 | | | | | | 1 | | 3 | 3 | | 2 | |
| Nebraska | | | | | | | | | | | | | | | | | | | | | | 1 | | |
| New Mexico | | | | | | | 4 | | 4 | 7 | 5 | | | | | | | 15 | | 15 | 15 | 10 | | 3 |
| Oklahoma | 2 | 1 | | | 2 | | 18 | 1 | 24 | 18 | 18 | 8 | 2 | | | 3 | | 70 | 1 | 84 | 80 | 64 | 13 | 13 |
| Texas | 8 | 1 | 2 | | 1 | | 64 | 9 | 85 | 74 | 105 | 26 | 5 | 5 | 1 | 5 | | 187 | 14 | 243 | 224 | 307 | 42 | 57 |
| East Tex. Border Co.'s | | | | | | | | | | | 1 | | | | | | | | | | | 2 | | 1 |
| Rest of East Texas | | 1 | | | | | 3 | | 4 | 9 | 6 | | 1 | | | | | 14 | 1 | 16 | 15 | 31 | 1 | |
| North Texas | 2 | | 1 | | | | 16 | 1 | 20 | 20 | 20 | 8 | | 2 | | | | 46 | 2 | 58 | 56 | 56 | 10 | 6 |
| West Central Texas | | | | | | | 6 | 1 | 7 | 5 | 11 | 3 | 2 | | | | | 18 | 1 | 24 | 23 | 45 | 5 | 9 |
| West Texas | | | | | | | 6 | 1 | 7 | 5 | 19 | 2 | 1 | | | 1 | | 14 | 1 | 19 | 17 | 40 | 4 | 9 |
| Texas Panhandle | | | | | | | | | | 1 | | | | | | | | 1 | | 1 | 1 | | | |
| Gulf Coast, Upper | 2 | | | | | | 5 | | 7 | 6 | 10 | 2 | | 1 | | 2 | | 13 | 1 | 19 | 16 | 28 | 5 | 11 |
| Gulf Coast, Lower | 3 | | 1 | | 1 | | 10 | 3 | 18 | 12 | 12 | 8 | 1 | 2 | 1 | 1 | | 28 | 5 | 46 | 40 | 44 | 13 | 14 |
| Southwest Texas | 1 | | | | | | 13 | 3 | 17 | 10 | 17 | 3 | | | | 1 | | 37 | 3 | 44 | 40 | 45 | 4 | 6 |
| South Central Texas | | | | | | | 5 | | 5 | 6 | 9 | | | | | | | 16 | | 16 | 16 | 16 | | 1 |
| Wyoming | | | | | | | | | | 1 | 3 | | | | | | | 1 | | 1 | 1 | 4 | | 3 |
| Total United States | 23 | 4 | 7 | | 9 | | 179 | 14 | 236 | 222 | 239 | 77 | 12 | 12 | 1 | 22 | 1 | 572 | 26 | 723 | 674 | 716 | 125 | 134 |

* Distillate included with oil discoveries. † Exclusive of semi-wildcat or extension tests. ‡ Extension tests.

# New Oil and Gas Fields and New Pay Horizons Discovered in the United States During March, 1943

This report embraces approximately one full month's discoveries. It includes some wells completed in late February but omits some completed in late March.

| County | Field | COMPANY, WELL AND LOCATION | Date Spudded | Date Completed | Total Depth (Feet) | Completion Horizon (Feet) | †Name, Character and Age of Producing Formation | *Initial Production, Method, and Choke | Grav. ity of Oil | Type of Structure | Method of Discovery | Preliminary Estimate of Reserves Found: Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | **ARKANSAS—New Oil Pays** | | | | | | | | | | |
| Columbia | Stephens-Smart | R. H. Crow, Tr.'s W. Taylor C-1, nw nw ne 12-15s-20w | 2- -43 | 3- -43 | 4000 | 2894–2910 | Glen Rose sd., L. Cret. | F 145 | 32 | | Drilling | About 19th known oil bearing sand of field. |
| Union | | Sam Richardson's Moody 1, sw ne 16-17s-14w, 2 mi w Rainbow, 2 mi e E. El Dorado. | 2- -43 | 3- -43 | 3518 | 3241–3247 | Trav. Peak sand, L. Cret. | F 240; ½" | | | | Well flowed 8 days; quit; trying to revive. |
| Union | Nick Springs | Fohs Oil Co. et al's Grace 1, nw se 31-17s-14w | 12- -42 | 2- -43 | 6710 | 4790–4793 | Cotton Valley sd., Jur. | F 95; ¼" | 37.5 | | | Unim.; well flowed few days; put on pump. |
| | | **CALIFORNIA—Oil Field Extensions** | | | | | | | | | | |
| Santa Barbara | | Standard's South Basin Lloyd Community 1, 15-9-33 | ..... | 3-21-43 | 7250 | 4559–4704 | ..... | P 35 | 8 | | | Unimportant. |
| Ventura | | Doheny-Battson-Los Nietos' Elkins 1, 2140' n, 1245' e, Sec 6-3-19 | ..... | 3- 1-43 | 5681 | 4877–4917 | ..... | F 115; ½" | 29.1 | | | Unimportant. |
| | | **ILLINOIS—New Oil Field** | | | | | | | | | | |
| Christian | Mt. Auburn | W. Marlow's C. Ralph 1, S/2 ne ne 27-15n-2w | 8-22-42 | 3-23-43 | 1905 | 1897–1901 | Silurian lime | P 22 | 37.4 | | | 30 mi ne nearest field. |
| | | **ILLINOIS—New Oil Pay** | | | | | | | | | | |
| Gallatin | Inman West | I. Green's Grant 1, se ne nw 15-8s-9e | 1- 8-43 | 3- 9-43 | 2543 | 2174–2214 | Tar Spgs. sd, U. Miss. | P 17 | 38.4 | | | |
| | | **ILLINOIS—Oil Field Extensions** | | | | | | | | | | |
| Franklin | Akin | Seaboard's U. S. Coal & Coke 8, c ne ne 26-6s-4e | 1-28-43 | 3-23-43 | 1332 | 3122–3128 | Aux. Vases sd, U. Miss. | P 275 | 37.8 | | | 1 mi s. extension. |
| Wabash | Friendsville | Skiles' Murray 1, se se se 34-1n-13w | 1-24-43 | 3-23-43 | 1805 | 1793–1800 | Palestine sd, U. Miss. | P 70 | 27.3 | | | ½ mi n extension. |
| Wayne | Mt. Erie | L. Romine's Kinney 1, ne se ne 16-1s-8e | 12-24-42 | 3- 9-43 | 3144 | 3134–3144 | Aux Vases sd, U. Miss. | P 22 | 37.2 | | | 1¾ mi sw extension. |
| | | **INDIANA—Oil Field Extension** | | | | | | | | | | |
| Knox | St. Francisville | J. E. Bauer & Sinclair Wyoming's E. H. Brevoort 1, nw sw 11-2n-11w, Vincennes Twp. | ..... | 3-30-43 | 1867 | 1859–1863 | McClosky sd, L. Miss. | P 105 | | | | NE extension. |
| | | **KANSAS—New Oil Fields** | | | | | | | | | | |
| Barton | Roesler | Helmerich & Payne's Roesler 1, se se nw 14-18-11w | ..... | 3-12-43 | 3313 | 3291–3299 | Arbuckle lime, Ord. | P 151 | 34 | | | Not promising discovery; some water. |
| Phillips | N. Dayton | Tom Allan & Cooperative Oil Co.'s Skelton 1, ene nw 13-2s-19w | ..... | 3-10-43 | 3737 | 3406–3422<br>3488–3502 | Lansing K.C. lime, Penn. | P 172 | 37 | | | N. stringer from pay in Dayton field. |
| Saline | Salina | Westgate-Greenland Oil Co.'s Sudendorf 1, nw nw se 30-14-2w | ..... | 3-27-43 | 3232 | 3222–3232 | Viola lime, Ord. | P 125 | 35 | | | Indefinite strike; if on trend, well is important; if a minor anticline, unimportant. |
| Sheridan | Studley | Union Oil Co. of Calif.'s Pratt 1, nec sw 23-8-26w | ..... | 3- -43 | 4444 | 3808–3817 | K. C. lime, Penn. | F 1872 | 41 | | | Most significant test in state this yr.; promises fields in extension area of central Kansas uplift. Is well pronounced field, indefinite as to limits. |
| Stafford | Grunder | Cities Service's Grunder 1, sw ne ne 11-25-15w | ..... | 3-24-43 | 4500 | 3940–4030 | Lans. K. C. lime, Penn. | P 46 | 38 | | | Apparently not important; 50% water. |
| Stafford | Rothgarn | W. P. Faulkner's Rothgarn 1, c el se se 10-21-13w | ..... | 3-11-43 | 3609 | 3584–3594 | Arbuckle lime, Ord. | P 180 | 36 | | | Of doubtful importance. |
| Stafford | Va Lieu | Stanolind's Van Lieu 1, ne se ne 20-24-13w | ..... | 3-24-43 | 4079 | 4068–4079 | Arbuckle lime, Ord. | P 942 | ..... | Anticline | | Probably part of St. Johns field; if so, may involve 800 acres prospective oil area; water may require re-completion or plugging. |
| | | **KANSAS—New Oil Pay** | | | | | | | | | | |
| Pratt | N. Stark | Lion Oil Refg. Co.'s Ford 1, ne ne se 12-26-12w | ..... | 3- -43 | 4145 | 4137–4145 | Viola lime, Ord. | F 1031 | 41 | | | First oil well in gas producing area. |
| | | **KENTUCKY—New Oil Fields** | | | | | | | | | | |
| Henderson | Coraville | Carter Oil Co.'s Henry P. Barrett 1 | ..... | 2-15-43 | 2600 | -2195 | Aux Vases sd, U. Miss. | P 40 | ..... | | | Fair discovery, Illinois type. |
| Henderson | Robard | Carter Oil Co.'s Tom Denton 1 | ..... | 2-15-43 | 2740 | -2350 | Bethel sand, U. Miss. | P 101 | 36 | | | Fair discovery, Illinois type. |
| | | **NORTH LOUISIANA—New Gas Field** | | | | | | | | | | |
| Bienville | Lucky | Placid Oil Co.'s Nebo A-1, sw ne 11-15n-7w | 11- -42 | 3- -43 | 7804 | 6836–6864 | Pettit lime, L. Cret. | F 24 m.; 2½" | Gas | | Flank drilling. | May be sw extension to Bear Creek field. |
| | | **SOUTH LOUISIANA—New Oil Field** | | | | | | | | | | |
| St. Landry | Shuteston | Sun Oil Co.'s Burleigh 1, 640' s 81 deg. 41 mins e & 660' s 8 deg 19 mins w of nw c 45-ac unit in Sec 37-7s-4e. | 11-22-42 | 3- 6-43 | 11505 | 9495–9501 | Sand, Miocene | F 144; ⅛" | 31 | Faulted | Geophysics. | Good well; average discovery. |
| | | **SOUTH LOUISIANA—New Distillate Field** | | | | | | | | | | |
| Vermilion | Pecan Island | Humble's La. Land & Fur 1, fr sw cor sec 34 go e'ly alg sl 660', th n'ly 660' at r/a in sec 34-16s-1e. | 6-30-42 | 2-23-43 | 10857 | 10832–10847 | Sand, Miocene | F 10; ⅛" | 50.9 | Faulted | Geophysics | Limited reserve; not much drilling likely. |
| | | **SOUTH LOUISIANA—New Oil Pay** | | | | | | | | | | |
| LaFourche | LaFourche Crossing | Mikton Oil Co.'s Martinez 4, 1320' e & 330' s of disc well, being 660' fr nl of sec 132-15s-17e. | Orig. 9-30-40 | Workover 3- 6-43 | 10179 | 8660–8680 | Sand, Miocene | F 163; ⅛" | 60.2 | Salt dome | | Sands poor in this field, found in 1940. |
| | | **MICHIGAN—New Oil Field** | | | | | | | | | | |
| Ottawa | S. Holland | R. L. Sander's Walters 1, c ne sw 36-5n-15w, Holland twp. | 2- 9-43 | 3-16-43 | 1516 | 1515–1516 | Traverse lime, Devo. | F 270; ¾" | 44 | | Sub-surface | Small area; 1 mi w S. Zeeland field. |
| | | **OKLAHOMA—New Oil Fields** | | | | | | | | | | |
| Noble | | Atlantic's Boulden 1, se se se 12-21-2w | ..... | 3-14-43 | 5174 | 5058–5064 | Misener sand; Miss. | F 308 | 46 | | | Field is of minor extent. |
| Payne | | Stanolind's Ingham 1, sw nw se 28-20-4e | ..... | 3- 1-43 | 4156 | 4029–4048 | Misener sand; Miss. | F 191 | 43.4 | | | Considerable water; not promising. |
| | | **OKLAHOMA—Oil Field Extensions** | | | | | | | | | | |
| Caddo | Cement | Ray Stephens' Piersen 1, se sw se 35-6n-10w | ..... | 3-11-43 | 5753 | 5570–5690 | Medrano sand; Penn. | F 1680 | 36 | Lensing sd. | Trend | |
| Osage | E. Watchorn | Continental's Simpkins 1, csw nw 24-23-3e | ..... | 3-12-32 | 3833 | 3811–3833 | Wilcox sand; Ord. | F 539 | 43 | Nosing | Trend | |
| | | **OKLAHOMA—New Gas Field** | | | | | | | | | | |
| Comanche | | Texas Co.'s Cline 1, cnw ne 8-3n-10w | ..... | 3-14-43 | 1122 | 1020–1040 | Pontotoc sd; Perm.(?) | F. 4.8 mil; open. | Gas | | | |
| | | **EAST TEXAS—New Gas Field** | | | | | | | | | | |
| Freestone | Steward Mill. | Carter-Gragg Oil Co.'s W. W. Steward 1, 5250' ewl and 1864' nsl of Jas. James Sur 7 mi n of Fairfield. | 1-31-43 | 3- 1-43 | 4048 | 4001–4006 | Woodbine sand, U. Cret. | F 25 mil.; ¼" | ..... | | | Probably not big gas reserve, despite high pressure for depth; near 3 dry holes. |
| | | **NORTH TEXAS—New Oil Fields** | | | | | | | | | | |
| Jack | | Shell's L. N. Wolfe 1, 425' nsl & 481' wel of sec 3341, TE&L Co. sur., 3½ mi e by s of Jermyn; 1¾ mi of small shallower Strawn sand pool, recently depleted. | 12-18-43 | 2-24-43 | 5631 | 4375–4405 | Bend lime, Penn. | F 69; 2" | 40 | Anticline | Geology | 40,000 to 60,000 bbls; to get pipe line. |
| Jack | | Chas. H. Kadane's Lester-Cater-Shell 1, 660' out nwc TE&L Co. sec 3311. | 2-10-43 | 3- 9-43 | 345 | 265–274 | Cisco sand; Penn. | P 5; 2" | ..... | Anticline | Twin to deep failure | Unimportant; 50% water. |
| | | **NORTH TEXAS—New Oil Pay** | | | | | | | | | | |
| Montague | Mueller | Continental's W. A. Richardson 1, 956' fr se, 455' fr swl of 61.16-ac lse & F. Hamilton sur A-335, sw/c to 7218-23ft Simpson discovery. | 1- 4-43 | 3-27-43 | 6073 | 6015–6027 | Bend lime; Penn. | F 341; 5/8" | 40.2 | Anticline | Shows passed up by deeper producers. | Thin pay and water discount importance. |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Brazoria | Hall's Bayou | **UPPER TEXAS GULF COAST—New Oil Field**<br>Humble's Houston Farms Dev. 1-B, 6000' nol Hall's Bayou, 8000' nwl Perry Austin sur., sec 2, A-109. | 9- 2-42 | 2- 7-43 | 13253 | 10258-10280 | Frio sand; Olig. | F 620; ¼" | 42.5 | Deep seated dome. | Geophysics | Meager data indicate major reserve. Could be 5 to 25 mil. bbl. field. |
| Colorado | Ramsey | **UPPER GULF COAST—New Distillate Field**<br>Cities Service's Frank Stephens Co. 1, 1787' so & nel of 489-ac tr, P. K. Bartleson sur, A-84, 10 mi ne Columbus. | 10- 3-43 | 3- 1-43 | 10505 | 8320-8340 & 8948-8970 | Wilcox sand; Eoc. | F 100 & 3.4 mil; ¼"<br>F 130; ¼" | 61.8 | | Geophysics | May embrace several thousand acres gas-dist. area; but market lacking, no early dev. planned. Could be 2 to 10 mil. bbl. reserve. |
| Karnes | Hobson | **LOWER TEXAS GULF COAST—New Oil Field**<br>Seaboard's Rzeppa 1, 500' fr s & wl 101-ac lse, tract 22, Don Erasmo Seguin sur., A-10, 3½ mi sw Hobson. | 2- 7-43 | 3- 8-43 | 4803 | 4000-4010 | Reklaw-Carrizo sd; Eoc. | F 93; ⅜" | 31.5 | Faulted | Geophysics | Probably major fld for district (5 to 10 mil. bbls.); will stimulate dev. along new trend. |
| Jim Wells | Seeligson | **LOWER TEXAS GULF COAST—New Oil Pay**<br>Magnolia's Seeligson 38, 1980' sl & 3300' el of Los Jaboncillos gr on 20,887 ac tr. | 12- 1-43 | 2- 6-43 | 5950 | 5670-5672 | Frio sand; Olig. | F 91; ⅜" | 43.9 | Anticline | Flank drilling | Active for year, fld becoming large oil reserve, and not defined on all sides. |
| Bee | Mineral | **LOWER TEXAS GULF COAST—New Distillate Fields**<br>Dirks Bros.'s Page Est 2, 660' fr ne & sel's of nw 500-ac of 757-ac, Thomas Pilkington sur. | 12-15-42 | 3-10-43 | 8100 | 7464-7478 | Carrizo sand; Eoc. | F 130; ¼" | 50 | Faulted | Subsurface and Geophysics. | Opens prod. from sand not extensively explored; therefore may foreshadow oth. strks. |
| Nueces | Violet | Phillips' Huermann 1, 660' fr n & wl of a 280-ac. of Chas. Land sur 412, 1½ mi w Saxet field, 1½ mi sw Turkey Creek. | 12-28-42 | 3- 5-43 | 8176 | 7202-7208 | Frio sand; Olig. | F 18; ⅛" | | Faulted | Subsurface control | No large reserve yet indicated, but further drilling may enhance prospects. |
| Nueces | Shield | **LOWER TEXAS GULF COAST—Distillate Field Extension**<br>Sun's Clark 1, 440' fr wl & 1650' fr nl of AB&M sur 149 on 344-ac lse. | 2- 1-43 | 3- 3-43 | 6075 | 6963-6965 | Frio sand; Olig. | F 130; ¼" | 63 | Faulted | Flank drilling | ½ mi ne extension; raises reserves materially |
| Duval | Strake | **SOUTHWEST TEXAS—New Oil Field**<br>Geo. W. Strake's Ira Yates 1, 660' fr s & wl 80-ac tr, SA&MG sur 1, AK526. | 12-10-42 | 2-17-43 | 4010 | 3168-3172 & 3723-3731 | Govt., Wells, Pettus sands, Eoc. | F 25; open | 24 | Faulted | Subsurface control | Two wells promise above-average field (1 to 5 mil. bbls.) |

* Barrels of oil per day (24-hr. rate), flowing, pumping, or swabbing; or millions of cubic feet of gas daily; open flow capacity; size of choke given in inches. † Ages of producing formations abbreviated as follows: Mio, Miocene; Olig, Oligocene; Plio, Pliocene; Eoc, Eocene; U. Cret, Upper Cretaceous; L. Cret, Lower Cretaceous; Jur, Jurassic; Tri, Triassic; Perm, Permian; Penn, Pennsylvanian; U. Miss, Upper Mississippian; L. Miss, Lower Mississippian; Miss, Mississippian; Devo, Devonian; Sil, Silurian; Ord, Ordovician; Cam, Cambrian.

the rate of wildcat completions as compared with February, a total of 236 including semi-wildcats for March, against 222 for February.

Exclusive of the semi-wildcats and extensions there were 213 completions in March compared with 210 in February, resulting in 34 discoveries compared with 29—16 percent productive in March against 14 percent in February. There were more discoveries in all categories in March than in February except new pays, which were off slightly.

The nation in recent years has been using around 1,500,000,000 barrels per year, equivalent to 125 million barrels per month. In order to replace currently all the oil that is being consumed, therefore, the nation should be finding 125 million barrels new oil per month.

During March, the first production was established in new fields, new pays, and extension areas which may eventually produce approximately the 125 million barrels needing to be found each month. But this newly found oil actually will require several years to develop and many years to produce.

It is much too early, of course, to attempt any close estimates of the ultimate production from producing areas discovered during March, in most of which only one or several wells have been drilled. However, by taking into consideration the types of fields involved, areas in which they are located, any available geophysical data, and other information, some rough estimates can be made; and on that basis it is indicated that the March discoveries ultimately may yield maximum output of 100 million to 150 million barrels. These figures represent, it should be stressed, not definite additions to reserves but possible reserves yet to be developed. Furthermore, these are top estimates. By using minimum or definitely conservative estimates the March discoveries are indicated to have added no more than 50 million barrels of reserves, yet to be developed. On the basis of the latter figure, less than half as much oil was found during March as was being used.

Fortunately, about one-half of the new oil found through the March discoveries was situated in PAW District 2, where the demand for petroleum is greatest, because of the transportation shortage. These fields were found where they were needed most. The District 2 discoveries were primarily in Illinois, Kansas, and Oklahoma, although discoveries were made also in Indiana, Kentucky, and Michigan. Oklahoma did not do as well as Kansas or Illinois. Almost all of the other half of the new oil found in March was in fields of District 3, and those discoveries were limited almost wholly to the Louisiana-Texas Gulf Coast and Southwest Texas, only minor discoveries having been made in North Texas, East Texas, Arkansas, and North Louisiana.

West Texas and East Texas both have scored important discoveries recently but not until after the end of March.

Although California sorely needs new fields, two unimportant extensions of established fields represented the fruit of prospecting in that state.

Among all the discoveries of March there was not a single definitely indicated major field. However, there was one which appeared to have possibilities of obtaining that distinction ultimately, namely, the Hall's Bayou field on the Upper Gulf Coast of Texas, which conceivably could produce eventually more than the 20 million barrels commonly regarded as necessary for ranking as a major field. One new field in South Louisiana, Shuteston, in St. Landry Parish, is regarded as fairly important, with prospects of being an average field for that district of relatively prolific producing areas. Several other discoveries of the Upper and Lower Texas Gulf Coast and of Southwest Texas ultimately may produce quantities up to 10 million barrels each.

The most important discovery on the Lower Texas Gulf Coast was the Hobson field in Karnes County. The discovery is important in that it establishes good pays in a deeper sand section (Claiborne and Wilcox series), and that an entirely new exploration trend is opened to development. Detailed information has not been released on the Karnes County strike, made by Seaboard Oil Company, although the production is fairly prolific and will lead to much more exploration work along what is called the Carrizo-Wilcox belt of Southwest Texas.

**Trends of Wildcat Completions**

| ITEM | Feb. 1943 | March 1943 | January-March 1942 | January-March 1943 | % Diff. |
|---|---|---|---|---|---|
| **Including Semi-Wildcats:** | | | | | |
| Total Completions | 222 | 236 | * | 723 | ..... |
| Productive: Total | 34 | 43 | * | 125 | ..... |
| Percent | 15.4 | 18.3 | * | 17.2 | ..... |
| Dry: Total | 188 | 193 | * | 598 | ..... |
| Percent | 84.6 | 81.7 | * | 82.8 | ..... |
| **Excluding Semi-Wildcats and Extensions:** | | | | | |
| Total Completions | 210 | 213 | 716 | 674 | — 5.8 |
| Productive: Total | 29 | 34 | 134 | 102 | — 23.8 |
| Percent | 13.9 | 15.9 | 18.7 | 15.1 | ..... |
| Dry: Total | 181 | 179 | 582 | 572 | — 1.7 |
| Percent | 86.1 | 84.1 | 81.3 | 84.9 | ..... |
| **Discoveries:** | | | | | |
| Oil: New Fields | 16 | 19 | 76 | 70 | — 7.8 |
| New Pays | 8 | 7 | 45 | 12 | — 73.3 |
| Extensions | 5 | 8 | * | 21 | ..... |
| Distillate: New Fields | 3 | 4 | 2 | 7 | +250.0 |
| New Pays | .... | .... | * | .... | ..... |
| Extensions | .... | 1 | .... | 1 | ..... |
| Gas: New Fields | 1 | 4 | 9 | 12 | + 33.3 |
| New Pays | 1 | .... | 2 | 1 | — 50.0 |
| Extensions | .... | .... | * | 1 | ..... |

*Data on semi-wildcats not available for 1942.

# Discovery Thinking

By A. I. LEVORSEN, Geologist, Tulsa, Oklahoma

*Part 2 of an address before the annual meeting of American Association of Petroleum Geologists, April 7, 1943, Fort Worth, Texas.*

**With still vast volumes of favorable formations, declining rate of discovery indicates something seriously wrong with prospecting methods. Need is for creative and research geology in place of routine geology, with opportunity and encouragement provided for developing new ideas.**

**Is our economy framework properly tuned when bigger pay jobs are in administrative and production duties? Is our operating framework good when 90 percent of a geological department's time is spent in routine, development and administrative duties, instead of searching for new fields? Does it make sense for industry to continue to look for structural traps when big majority of past discoveries have been stratigraphic accumulations? Are our new exploration tools generally designed to catch the eye of the executive rather than the elusive oil field?**

A NUMBER of published surveys as well as numerous governmental hearings have shown the steadily declining rate of new oil discovery during recent years and 1942 appears to have the poorest record of all. This decline has been, according to Lahee,[3] in spite of an increase in the wildcat footage drilled and in spite of an increase in the total number of wildcat wells drilled. The new fields average smaller in size, and even if they are greater in number, the total amount of new oil discovered is annually becoming less and less. Obviously something is seriously wrong.

An attempt was made in Part 1 (THE OIL WEEKLY, April 12) to show that from two lines of geological thinking we have reason to believe there are still vast volumes of rocks in which geological conditions are known to exist which may reasonably be expected eventually to become translated into equally large petroleum reserves. The question of the failing rate of discovery is then not yet to be answered by saying it is due to a lack of oil to be discovered.

On the other hand, the oil industry has spent vast quantities of money in an effort to make discoveries, it has established large and expensive exploration departments, and it has apparently spared no expense nor effort in utilizing to the fullest extent everything that it thought might contribute to the finding effort. Great as this finding effort has been, it is not enough to do the job. Some think that an increase in the price of oil, a subsidy to the wildcatter, or some other form of increased advantage to those who are charged with discovery will result in the necessary increase in reserves. While it seems obvious that a prerequisite to any successful discovery program on a national scale is a price which will provide enough incentive to take the necessary risks, our particular concern, as petroleum geologists, is to increase discovery and decrease risk under whatever economy prevails.

It is often said that what the oil industry really needs is a new exploration tool, like the fisherman needs some new tackle. But, like the fisherman analogy, when it is remembered that the new fishing tackle is generally designed to catch the eye of the fisherman and not necessarily the eye of the fish, it gives cause to wonder whether or not some of the new gadgets or devices continually coming into the discovery picture may be more of the nature to catch the eye of the contour-minded executive rather than the elusive oil field which it is hoped to find. Some of the most successful fishermen are those who use only the old fashioned hook and line with a little bait, and maybe we can learn from them.

Whether the economic framework within which we must operate is good or bad, we have an unused tool as old as geology itself. It is simply more geology. Not only should such a procedure prove effective, but it is relatively inexpensive as compared with current exploration costs, and in addition, it has the distinct advantage of being something with which we are now familiar. We can start off with it now without waiting for some unknown device to be discovered.

Before exploring the matter further, it might be well to point out that more geology means either more geologists, better pay for geology as such with a consequent better geology, or both. The young geologist, when he starts out, equipped with his full quota of ambition, energy, enthusiasm, and a desire to do things, looks about him and observes that the big-pay jobs are not for geology as such but for office, administrative, and production jobs in which geology merely furnishes the background. Is it any wonder that he gradually turns his attention and energy to the business of the oil industry and lets geology lag? He finds there is a salary level, different in different companies, yet nevertheless present, above which he cannot rise as a geologist dealing in rocks, samples, and field observations, but which is readily penetrated if he

can do administrative or office geology dealing in maps, appraisals, reports, surveys, and data secured by others. The fault is not with the individual but with the system which gives so much more tangible recognition to the superficial and leaves the more fundamental factors to chance.

The correct identification of an unconformity and the correct interpretation of its meaning from well cuttings thousands of feet down in the ground is not an administrative job, it cannot be done by just anyone, and its identification may well be of greater direct importance to discovery than all of the other geological, geophysical, and administrative factors together. Yet almost any office job in the department is more desirable, pays better, and is more directly in line for further advancement.

When this association began, over 25 years ago, the objective of the few petroleum geologists then in existence was to find oil fields. Their full time was devoted to mapping and interpreting geological conditions with discovery as the objective. As time went on, and with the advent of geophysical methods, the role of discovery has gradually shifted to a large measure from the geologist as such, to the geophysicist, and the geologist is becoming more and more interested in the development operations of oil and gas, much of which has already been discovered, rather than in the discovery of new fields and new provinces. As a matter of fact, the modern oil company geological organization has become a general service department. It serves the production department continually with geological advice on drilling wells, advice on setting casing, advice on coring prospective sands, advice on well abandonments, and repeated advice as to whether the well is running high or low. It serves the land department with advice on rental payments, lease renewals, bonus payments, farmouts, lease abandonments, and drilling deals. It serves the executive department with innumerable conferences and a continuous stream of reports, of statistical information, competitive production records and with answers to the thousand and one questions that are always being asked. It serves the legal department as witnesses and developing evidence in lawsuits, and it serves the pipe line department in advising on the prospects for discovery in the wildcat wells that are drilling near the company pipe lines. The geologist has in effect buried himself in routine service work.

All this work is important to an oil company and in order to do it properly and efficiently, an increasing amount of administrative work becomes necessary. Governmental forms have to be filled out, voluminous records have to be kept and have to be instantly available, costs must be kept down and all sorts of miscellaneous maps must be kept continually up-to-date. The daily conferences, reports, and administrative details, whether in the district offices or in the main office, require an ever-increasing part of the total effort so that the thinking necessary to oil discovery gets secondary consideration or is turned over to the geophysical department. By his training, his ability to think in terms of earth variables and his understanding of the problems involved, the geologist is particularly well fitted to do all of these tasks which have been assigned to him, and all of them are necessary and desirable, not only for the company but for the geologist as well. They give a stability to his employment and a constantly visible reason for his existence which is most comforting. But, they are not directly concerned with the thing which he can do best and which is of greatest importance to the petroleum industry, and that is the discovery of new oil fields.

**TABLE 1**

**Ratios of geologists to seismographs in the exploration departments of 17 typical oil companies operating in the United States outside of California.**

| Company | Seismographs | Geologists | Geologists per Seismograph |
|---|---|---|---|
| A | 3 | 9 | 3. |
| B | 2 | 8 | 4. |
| C | 10 | 40 | 4. |
| D | 16 | 48 | 4. |
| E | 23 | 97 | 4.+ |
| F | 9 | 41 | 4.5 |
| G | 15 | 85 | 5.7 |
| H | 8 | 46 | 5.7 |
| I | 11 | 64 | 5.8 |
| J | 4 | 24 | 6. |
| K | 16 | 98 | 6.+ |
| L | 4 | 30 | 7.5 |
| M | 5 | 38 | 7.6 |
| N | 8 | 66 | 8.2 |
| O | 6 | 50 | 8.3 |
| P | 6 | 50 | 8.3 |
| Q | 4 | 36 | 9. |
| Totals | 150 | 830 | |
| Av'ges. | 9— | 49— | 5.5 |

In an attempt to further analyze the modern discovery process, a survey was made of the number of seismograph units as compared to the number of geologists in 17 representative oil-company exploration departments. The results are shown in Table 1. It is seen that the number of geologists per seismograph ranges from 3 to 9. If an average figure of $10,000 per month be used as the cost of a seismograph and $500 per month be used as the average cost of a geologist, which includes office help, draftsmen, and filing clerks attached to the geological department, it is seen that the money spent on geologists ranges from 15 to 45 percent of the amount spent on seismic surveying. The average is 30 percent.

As has been pointed out, the modern geological department spends but a relatively small part of its time in searching for new oil fields and by far the major effort—probably fully 90 percent—on routine connected with production and development problems in and around fields which have already been discovered, and on routine clerical and administrative work. The amount of money spent directly by the geological department in search for new oil and gas fields—in what might be called "discovery thinking"—is thus only an average of one tenth of the 30 percent or 3 percent of the amount spent by the geophysical department, when these two departments are considered separately.

Stated still differently, all the money spent on seismic surveying, plus most of that spent on the part of geology devoted to discovery, goes into a search for structures, in which it is hoped oil will be found. When one remembers that at least a third and probably a half of the past production and present reserves are located primarily as a result of some stratigraphic variation or anomaly of sedimentation, and in addition, as has been shown, even most regions where the individual oil pools are structural, the province as a whole is fundamentally related to major stratigraphic variations called wedge belts of porosity, it is seen that the big majority of all our past discoveries have in them a stratigraphic factor, either directly or indirectly responsible for the accumulation of oil. Since most of the 3 percent of the strictly geological time and thought spent on discovery is concerned chiefly with structural studies, we might truthfully say that less than 1 percent of our total discovery effort is devoted to the kind of geology which is known to be responsible, either wholly or in part, for most of our oil. It does not make good sense.

Nothing herein should be interpreted as meaning there should be less seismic surveying, but rather that there should be a greater proportion of geology put into the discovery effort. Not only is it proposed that a greater proportion of geology be employed but that this increase be devoted primarliy to discovery rather than to development. There are many geological discovery tools rusting away in our kit for want of use. The need is for "creative" geology as compared to what might be called "routine" geology.

An opportunity must be provided for those men with the capacity and with the ability for doing creative geology to actually do geology and in addition to be able to spend a part of their time with their feet on a desk looking out of the window where they can reconstruct in their mind the conditions and the environments of past geologic ages.

What we need is more of the sort of geology that Philip King did in West Texas and New Mexico, or the kind that Marshall Kay is doing in the Appalachians, or that Ross Heaton has done in the Rocky Mountains, or that was so ably done by Ralph Reed in California. There are enough discovery ideas and prospective provinces in reports such as they have published to justify any company looking for new ideas to keep men continuously on this sort of work as a practical and economical oil-finding attack.

We have been inclined to lean too heavily on mechanical devices to carry on the discovery process for us and not enough on coordinated personal observation, individual interpretation and understanding. These mechanical crutches, if used too long or too intensively, gradually dull our ability to carry our discovery thinking through to a successful answer, and as we become increasingly dependent on outside help we become decreasingly able to do without it. The unused talent finally is lost.

There are several kinds of geology, the doing of which should result in more discovery, and some of them are discussed in the part which follows.

### Wedge Belts of Porosity and Layers of Geology

If you agree that wedge belts of porosity are commonly a fundamental prerequisite of an oil province and that successive layers of unknown geology underlie much of the sedimentary region of the United States (see Part 1), then you must reach the conclusion that the only known way of reducing these conditions to practical application is through a strictly geological approach. Such an approach means the preparation and study of facies maps; lithologic maps; isopach maps; paleogeographic maps; paleogeologic maps; quantitative and qualitative sedimentation studies; and detailed stratigraphic analyses of every porous sedimentary rock unit in the United States and eventually in the world. It means a resolving of the great mass of geophysical data into stratigraphy and sedimentology as well as into structural geology. The basis for this work is a restudy, first, of all surface outcrops, most of which will have to be re-examined from a stratigraphic and sedimentational viewpoint as well as structurally; and second, a re-study of the detailed subsurface data now in the files and laboratories of the oil industry in the form of well cuttings, cores, electric logs, porosity and permeability measurements, water, oil and gas content, geophysical and geochemical data, and anything which will throw light on the location of a wedge edge of porosity or the crossing of an unconformity into new and unexplored geological conditions.

When you accept into your geological thinking the philosophy of wedge belts of porosity and layers of geology, you must at the same time agree that there remains many times as much fundamental commercial geology to be done as has been done in all of our past geological experience. Most of the information in the unexplored regions is and always will be fragmentary and inconclusive, and it is for this reason more than any other, that experienced, broadly trained, and speculative minded men will have to be developed. Moreover, this kind of geology is not the type that can ordinarily be done as a casual task between conferences, but it is the kind that will require hours, months and years of the most careful study, thoughtful analysis, and imagination without end.

### Limestone Reef Fields

Petroleum geologists in West Texas and New Mexico, working with the limestones and dolomites of Permian age, have led the way to a better understanding of the role that limestone reefs play in the accumulation of oil and gas. While there is a voluminous geologic literature concerned with the problem as it is developed in the Permian Basin, yet there is little or no work being done on the larger problem of reef production generally. Reef production is not confined by any means to the Permian Basin. The Southern Fields, or "Golden Lane" of Mexico, for example, produce their oil from reef limestones in the Middle Cretaceous. Undoubtedly much of the early Devonian production in Southern Ontario is related to reef-like deposits, and many wells of thousands of barrels daily production were found at unusually shallow depths. Likewise, the limestones producing in Michigan probably have in many of them reef elements of which a better understanding would provide more discovery.

A few years ago, Laudon and Bowsher described the numerous reef deposits which crop out in the Mississippian limestones of Southeastern New Mexico[4] and now we learn of several rich oil pools being found in similar but buried Mississippian limestone reefs in the North Texas region. Even more unusual are the several pools producing from thick limestone reef material in the otherwise uniformly bedded shales and thin sands and limes of the Pennsylvanian of North Texas.[5]

There are enough oil pools which are now known to produce from limestone reefs or from reef-like deposits to justify the conclusion that there are a great many more yet to be discovered. Every company might well have an expert on "reef" production—a person of broad geological experience, skilled in the interpretation of geological conditions from well cuttings, able to visualize subsurface conditions and geological environments, and one who would devote his entire time over a period of years to this problem. The problem of reef production is fundamentally geological and the cost of such work in terms of the discovery possibilities is insignificant.

The amount of production which has been obtained from shoestring and lensing sands in the United States is probably much greater than is generally supposed. Individual pools are both large and small, there are many of them, and in the aggregate they account for a substantial part of the national supply. There are dozens of such pools in Pennsylvania, in West Virginia, in Ohio, Illinois, Indiana and Kentucky, in Kansas, in Oklahoma, and in Texas, and with but very few exceptions they were discovered without benefit of geology, geophysics, or much, if any, scientific reasoning.

There was a time during the development of the shoestring and lensing sands of Southeastern Kansas and Northeastern Oklahoma when they attracted considerable scientific interest and articles descriptive of them were published by Rich, Cadman, Charles and others. When the shoestring sands of Greenwood County, Kansas, were being first developed, Sidney Powers was much concerned over their origin and how they might be more scientifically prospected. He was particularly interested in getting different views and explanations of some of the possible origins and once said, "I hope before they are all developed that someone who has seen a sand bar along the ocean shore will become interested in studying them. As a matter of fact," he continued, "those who are doing all of the present philosophizing are 100 percent landlubbers and I have a hunch that these are not stream channels but are buried ocean sand bars. I would be most happy to have someone who has even seen the ocean take a look at them."

Bass[6] went to the ocean and came out with his classic shoestring-sand studies which answered for a long time many of the perplexing questions concerned with these deposits. Since then, however, interest has lagged and apparently the oil industry is content to leave their future discovery to the random wildcatter as in the past.

Yet, here is a field of study which most certainly will yield results if attacked scientifically. Such attack would be purely geological in nature and probably largely in the field of detailed sedimentology. It would depend in a large measure on a thorough understanding

of all the phenomena of sand deposition along varying sea coasts, on the ecology of such regions, and on the ability to identify sand forms accurately with small amounts of data. Is it not probable that detailed sedimentation studies will enable one skilled in lensing sands to tell whether the test well is on the lagoonal side of the sand bar or on the off shore side? and thereby accurately advise which direction to move in order to encounter more sand? or whether the well is near the end or the sides of the sand deposit? or that the sand encountered is a stray sand or a blanket sand? Sedimentationists are thinking in these terms and one has only to read the writings of Krumbein, Pettijohn, Krynine, Russell and others, to see that they are thinking in terms far in advance of what we as commercial geologists are content to call satisfactory.

In terms of probable results, the cost of keeping experienced geologists on this type of exploration problem over a period of years is negligible. As in other fields of geology, however, it is a kind of work that calls for broad experience, imagination, keen interest in the geological problems involved, and the confidence of the management which will permit much drilling on reasons that might now be called unorthodox. Any oil company looking to the future might well put one or more geologists permanently on such work, men who will eventually become expert in the identification, prediction, and understanding of this much neglected type of production.

**Detailed Surface Structural Mapping**

We hear it said that the day of surface mapping is over. Certainly it has declined in importance in the normal exploration programs to the point where it is often difficult to find geologists capable of doing even an ordinary detail job when such emergencies develop. It is probably true that the heydey of "reconnaissance" surface mapping is past in the United States but it can be seriously questioned whether detailed plane-table mapping is not still an extremely effective discovery tool. There has been done actually but a relatively small amount of really careful, detailed surface plane-table mapping particularly with the assistance of aerial photographs. Over and over again we hear of geophysical or subsurface prospects which it is later remembered or determined underlie surface anomalies, and we likewise hear of geophysical and sursurface failures which underlie readily workable yet perfectly normal surface structures. The value of detailed surface geological mapping is too often recognized after it is too late rather than as a primary discovery technique.

Two examples of recent discoveries resulting from surface mapping show that such methods are by no means ready to be put on the shelf. The first is the discovery of the East Watchorn pool, Pawnee County, Oklahoma, by Alma Oil Company. Everett Carpenter, known to many of you as having practiced petroleum geology in the Mid-Continent region for the past 30 years, was in the employ of the Alma company looking after some drilling in the old Watchorn pool. While driving back and forth to work he observed some abnormal surface dips and spent two or three days in working out a rather detailed reconnaissance map of the area of the disturbance.

On the basis of this work Alma Oil Company decided to shoot the area and results of variable quality were obtained, probably due to the considerable alluvium in the area. Enough was indicated, which, when added to the surface mapping, caused the company to lease a block at a dollar per acre and drill a test well. The result was the discovery in the Wilcox sand of what is now known as the East Watchorn pool, and which it is interesting to note follows the surface mapping more closely than it does the seismic interpretation.

Two things stand out in this case history. First, if it had not been for the fact that Everett Carpenter, with his wealth of experience, was out in the field looking for surface anomalies, there would in all probability still be no pool at this locality; and second, it is absurd to say that even in such an old and established area as Northern Oklahoma the surface geology has been adequately mapped when a structure such as this can be discovered by reconnaissance methods.

The second example of discovery resulting from surface mapping is that of the Hawkins field in Wood County, Northeastern Texas, as told to me by Morgan Davis. This area was mapped by E. A. Wendlandt, of Humble Oil & Refining Company, in the summer of 1930. At that time not much significance was attached to the structure since it appeared relatively insignificant in comparison with other structures in the basin. However, in 1933 and 1934, the Long Lake and Cauyuga fields were opened under small surface structures and Humble leased a small block of leases on the fold which Wendlandt had mapped. Results from seismograph surveys were poor and thought was given to dropping the block or farming it out.

However, in 1937, at the insistence of Wendlandt that the area had possibilities, it was core drilled under the direction of T. J. Burnett with the result that the company acquired a much larger amount of acreage.

Although Humble did not actually make the discovery, its intention was to drill a test well and it was curing titles when Menziel completed his discovery well in December, 1940, at a location which later proved to mark the edge of the pool. Its block of 7000 acres of leases now has 361 wells and an oil reserve on the order of 400,000,000 barrels.

Here too the lesson to be learned is that surface detail work pays big dividends when done by one with experience and skill in this kind of geology. When done right it deserves top consideration in the search for oil fields.

Another lesson is that here is an enormous reserve under an apparently insignificant structural anomaly. It must have been classified far down on Humble's list of prospects for many years. Yet, when unconformities and variable geological history are added to what appear to be fourth- or fifth-rate prospects, they often have a way of changing into something entirely unforeseen and unexpected.

These are but two examples of many that might be presented to show that there is still a place for surface mapping; that it leads to oil and gas discovery; and that it is not a kind of work to leave entirely to the young geologist, but that it can be most effectively done by men of experience—which means such men must go out to where the outcrops are located. Surface geological mapping today should consist of more attention than heretofore to the sedimentary variations, facies changes, and stratigraphic studies which will bring it into more practical relation to subsurface studies, wedge belts of porosity, and problems related to overlaps, unconformities, and local and regional geologic history. Moreover, when it is remembered that 8 or 10 experiencel plane-table parties can be kept continuously in the field for the equivalent cost of one seismograph crew, the cost in relation to oil discovery is insignificant.

**Coordination of Data**

In the language of the automobile manufacturer, every oil field may be called a "custom-built job." Superficially they may look alike, but if we lift up the hood we find the insides vary from field to field. They differ in geologic history; in structural development; in sedimentary and stratigraphic relationships; in position with respect to the basins; in reservoir rock conditions; and in the physics of the contained liquids and gases. The possible combinations of conditions are almost infinite in their variety. This leads to the conclusion that each oil field is different than every other field and that the next field to be discovered will have a different combination of geological factors than anything that has been seen before.

*[Continued on page 20]*

# Gas-Oil Ratio Calibrations Used To Measure Gas in Gas-Lift Wells

By Don ATTAWAY, Arkansas Fuel Oil Company

**Measurement of gas linked to producing gas-oil ratio through ingenious comparison of records shown by 7-day recording meter and those obtained by fast clock units. Results permit separation of gas produced by well from amount injected, enabling proper accounting to be made without intricate calculations, while still economizing on chart and chart-changer expense**

WHEN wells in the Shreveport field, Caddo Parish, Louisiana, ceased flowing, they were equipped with intermittent flow devices. The first of these gas-lift installations appeared in May and June of 1941. Within two months, 10 of the 48 wells in the field were equipped and operating with intermittent gas-lift flow devices. At present, 22 of the 46 producing wells required high-pressure gas for lifting purposes.

A gasoline plant, owned and operated by Arkansas Fuel Oil Company, was equipped to compress its residue gas to a pressure suitable for gas-lift operations. In the early stages, two 110-horsepower gas engines were installed to drive two-stage horizontal gas compressors for raising the pressure from 60 to approximately 400 pounds per square inch. Later additional gas compressors were installed. These were steam-driven compressors. Four such units were eventually connected and an additional compressor purchased for operating on the field gathering system.

### Measurement Problem

With the original gas-lift installations, a measurement problem presented itself and for several months study and experiments were devoted to means of securing a record of the volume of gas injected into the wells and the volume of gas produced from the lease through the separator. The difficulty centered around the fact that all measuring units in the field were equipped with seven-day clocks. This was an economy measure inaugurated by the company to conserve charts and chart-changer expense. Wells able to flow under their own pressure produced more or less uniform records that were easily readable, but leases equipped with gas-lift devices produced a seven-day chart that was a blotch of red ink and "sun-flowered." (See picture.) Quite often the ink pens failed to hold enough ink to record differential pen movements over a seven-day period. Numerous attempts to correct this condition produced no acceptable solution. Pens with ample ink reservoir made continuous records that were impossible to read. Attempts to equip these leases with 24-hour clocks produced almost the same type chart.

The cause of this condition was, of course, the fact that gas-lift units were equipped with time-clocks or automatic injection devices to operate at set intervals such as 15-minute periods, 10-minute periods, etc. When the valve opened to admit a charge of gas to the well, the gas flow reached peak velocity immediately and the differential pen swept out to recording position almost in a straight line. Usually the injection period consumed only 2 or 3 minutes and the automatic valve shut off completely, causing the differential pen to fall back almost instantly down the same line it had recorded in ascending. Such a record was certainly unreadable. Dampening plugs and other devices were unsatisfactory as they actually retarded the differential pen movement.

**TABLE 1**
**Record of Gas Lift Ratios—Shreveport Field December, 1943**

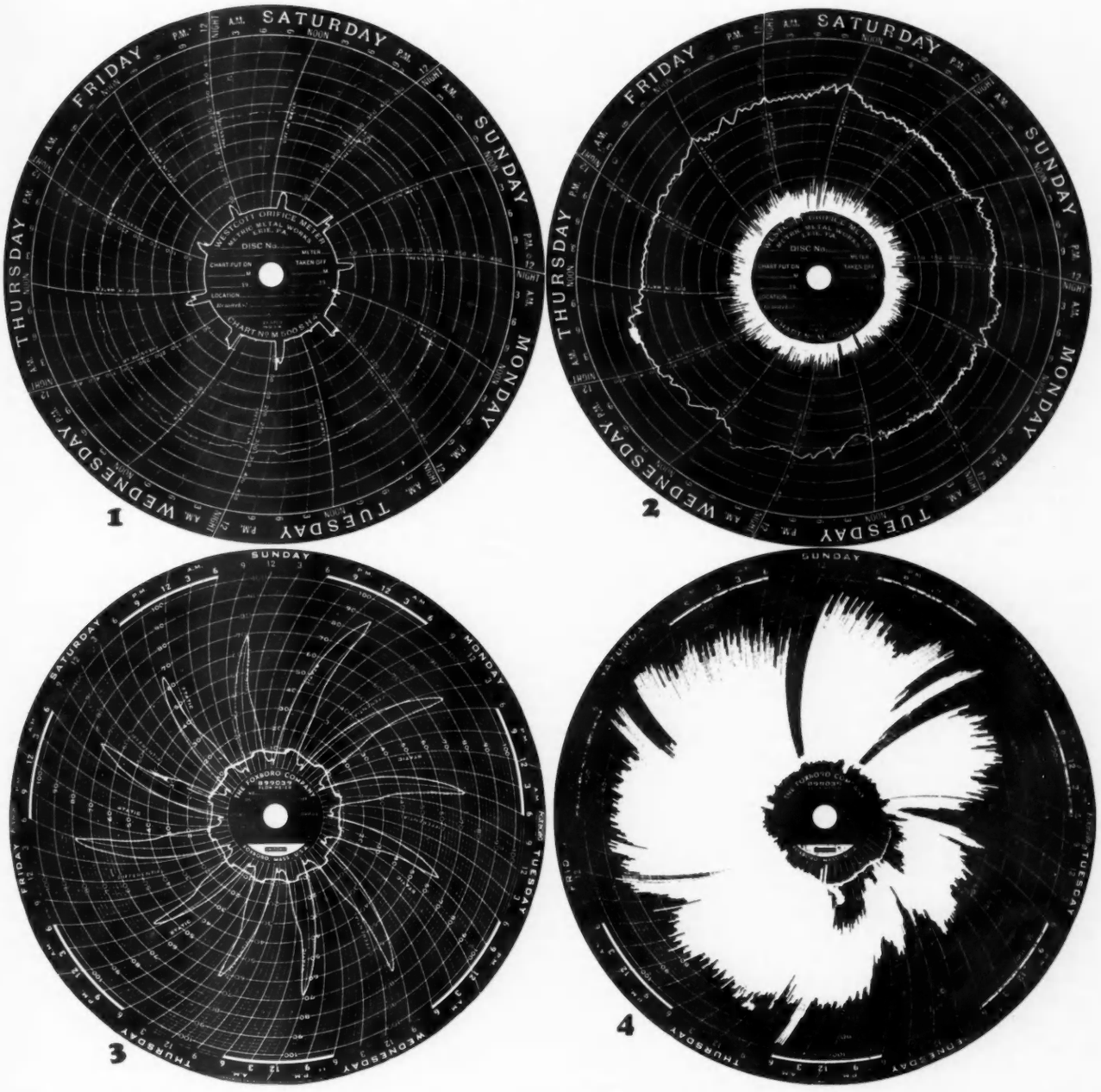
| WELL | MCF Gas Produced | MCF Gas Injected | Bbls. Produced | Gas-Oil Ratio |
|---|---|---|---|---|
| A | 10,862 | 8,116 | 3,721 | 2,194 |
| B | 6,155 | 3,885 | 3,721 | 1,044 |
| C | 6,213 | 4,273 | 2,223 | 1,922 |
| D | 10,455 | 3,344 | 3,310 | 1,011 |
| E | 6,265 | 1,076 | 861 | 1,250 |
| F | 4,234 | 2,472 | 1,186 | 2,084 |
| G | 4,563 | 1,626 | 1,185 | 1,372 |
| H | 5,161 | 4,442 | 211 | 21,050 |
| I | 9,528 | 8,986 | 346 | 25,970 |
| J | 9,576 | 6,585 | 444 | 14,830 |
| K | 12,979 | 5,011 | 3,228 | 1,552 |
| L | 7,174 | 2,361 | 1,889 | 1,250 |
| M | 2,812 | 2,792 | 399 | 6,998 |
| N | 11,114 | 7,224 | 3,600 | 2,007 |
| O | 5,956 | 3,759 | 3,601 | 1,044 |
| P | 5,948 | 4,090 | 2,128 | 1,922 |
| Q | 7,725 | 6,349 | 2,124 | 3,142 |
| R | 30,812 | 23,275 | 5,002 | 4,894 |
| S | 4,745 | 2,770 | 1,329 | 2,084 |

Gas-measurement engineers have coped with such a problem for years and while equipment has been devised that will handle such a condition, the war shortage of material and instruments prohibited the purchase or use of such a meter.

Correct measurement of gas to and from the lease was imperative as such information was required in making severance-tax payments, royalty settlements, conservation-department reports, and other engineering information.

### Measurement Solution

The solution of the problem selected was the use of gas-oil ratio tests. Several special type clocks were purchased having devices for setting the rotating time at 1-, 3-, or 6-hour intervals. The process involved a tester or meter man making a visit to the lease using gas lift and removing the seven-day clock from the lease meter. A "fast" clock was installed and a chart placed on the meter. The meter was tested for "zero"




**The charts numbered 1 and 2 are actual charts from a lease operating on gas lift. Chart No. 2 is a regular 7-day chart measuring the gas injected into a well operating on gas lift at 15-minute intervals, and is unreadable. Chart No. 1 is the registration on the same meter using a 3-hour clock. The charts numbered 3 and 4 are actual charts from the lease measuring the gas production from the separator to the gasoline plant. Chart No. 4 is the appearance of the regular 7-day chart operating under the gas lift conditions, unreadable. Chart No. 3 is the registration on the same meter using a 3-hour clock, and is easily read.**

and then placed in service. The oil storage tank into which the well was producing was then gauged. Both the injection-gas meter and the production-gas meter could be fitted with the special clock for the test period.

If the clock was set for a 1-hour rotation and the well intermitter operating on a 15-minute schedule, the chart would secure a record of 4 injections. As the orifice meter clock is running at a very fast speed; the differential hand, in moving out across the chart, covers some distance. If the injection period is as short as 3 or 4 minutes, almost 1/12 of the chart surface passes beneath the differential pen during the injection. Such a record is very readable and accurate.

It might be well to consider in comparison, that with a seven-day clock and chart, this period would be represented by 1/380 of the chart surface. So the differential record actually is magnified more than 30 times.

In order to secure an average and representative record of the well's behavior and operation, a chart might be taken every hour for 3 hours. In cases of varying recordings, the test might be extended to 6 hours. Wells having injection periods 30 minutes apart might use a clock rotating in 3 or 6 hours. Such a clock speed will be ample to record a very readable differential record.

At the conclusion of the test, whatever its period, a gauge must be taken of the well's production during the period. Having secured readable charts and knowing the well's exact production, it is possible to calculate the amount of gas required to lift a barrel of oil. Using the production-gas meter,

the amount of gas produced with each barrel of oil can be determined.

A sample of the recording of such information is shown in Table 1.

As long as the well remains in normal operation, records can be assumed to be representative of the daily performance of the well. Check-ups and re-tests have proven this to be the case. However, there are times when the well operator desires to change his intermitting time or alter his clock cycle. This, of course, requires a corrected test. In numerous tests resulting from such operation, it has been found that often the ratios are unaffected. The oil-production figures might vary, but the gas injected and produced conforms well with the increase or decrease.

At the conclusion of the ratio tests, the usual 7-day clocks are replaced in the meters and corresponding charts placed. The recording of the meter has been found of value to the lease switcher and operator in giving him information on the pressure available, the extent of the differential at each injection, and an index to the operation of his lease equipment. It furnishes, also, proof of operation.

In order to utilize the gas-ratio figures for accounting purposes, the well operator must supply figures on the total oil production during each month, whereupon this figure is multiplied by the gas-lift ratio to determine the amount of gas used for lifting. The gas production of the lease is determined by the gas-oil ratio figure multiplied by the barrels of production. It is possible, also, to calculate the amount of gas actually produced from the sand by deducting the volume of gas injected into the well from the amount of gas produced at the separator. Such information is vitally important to the well operator in securing allowables for his well.

This method of accounting has proven satisfactory under the conditions. The economy of charts and chart-changer expense is permitted and records are accurate to a high degree. Special cases might be found or developed which cannot be placed in the category but figures secured from such tests are accurate within the operability and limits of orifice measurements.

It is to be remembered that this method of accounting for gas does not take into account any fluid produced from the well other than oil. Operators desiring information on the amount of water lifted can secure such information from other sources.

The measurement problem on gas-lift units in this field has been solved by the gas-oil ratio test and possibly other fields and other operators might investigate the method for application to their operation.

## Discovery Thinking

[*Continued from page 17*]

There is much in the science of geology besides structural geology which can be applied to the discovery of new oil and gas fields. Yet we persist in applying mass production methods—in our case we might call it mass structure surveying—as practically the sole discovery tool. True, geologic structure is the most obvious, the most readily determined and therefore the most quickly exhausted of any of the factors which it is believed have a bearing on the occurrence of oil and gas, but it is by no means the whole answer. And even in our structural work, we find ourselves too often adhering to one of the several kinds of structural surveying—surface, subsurface or geophysical—to the exclusion of the others. The discovery process is complex and we dare not leave it up to any single method or technique. With the several dozen kinds of devices for obtaining detailed and accurate geologic data of all kinds, our problem of blending, coordinating, and interpreting all of this information, and putting it to work in discovery becomes more and more important.

The story of the discovery of the Pauls Valley field in Garvin County, Oklahoma, well illustrates the possibilities of coordinating variable data by one with broad geological experience. As far back as 1928, Ira Cram, then district geologist for The Pure Oil Company, recognized the fundamentally favorable regionally high structure of the area, and started working on it. In an effort to localize structural closure on this broad arch, surface detail mapping was done which resulted in some ideas, but generally the beds exposed were such that detail mapping was impossible over much of the area. Magnetic work failed to show anything of interest and, in 1933, seismic operations were commenced. The subsurface geology was complex and the difficulties of interpretation were great, but during seismic reconnaissance, enough encouragement was obtained to justify the leasing of several anomalies, one of which later included the Pauls Valley pool.

Between 1934 and 1937, 13 Ordovician dry holes were completed in the Pauls Valley district, none of which offered any definite promise of future discovery. Cram, however, re-examined all the seismic data in the light of the detailed sample information revealed by these dry holes, coordinated the information, and as a result, reworked the geology of the entire area. From this restudy, the geolgic history was worked out with fair accuracy, additional detailed seismic work performed, and relationships were established which had been indefinite or merely suggested.

Between 1937 and 1941, four more dry holes were drilled, all them in the vicinity of what is now the Pauls Valley field, but all without giving any indication of the presence of commercial oil. These later holes, however, did confirm the geological interpretation which had been developed as the result of the detailed geological and seismic work, and in 1942, The Pure Oil Company found production in the Bromide sand of Ordovician age. There are now 14 flowing wells in the pool and the limits are not yet defined.

Many other companies held leases in the vicinity and many geologists at one time or another saw the possibilities of the area. However, the continuously discouraging results of 17 dry holes drilled during the 8 years between 1934 and 1942 dulled their enthusiasm and the general opinion of the possibilities of the area at the time of the Pure discovery were pretty low.

The lesson for all in this discovery is that if it had not been for the persistence of Cram; his technical experience and interpretive ability to coordinate detailed well-cutting data, surface structural maps and geologic history with geophysical data; and the faith The Pure Oil Company placed in his judgment in drilling when nearly everyone else had given up hope, then the Pauls Valley field would still be undiscovered and probably remain so for many years to come. How many more similar areas are now lying in the files, more or less condemned, yet waiting to be reworked in the light of modern concepts, with modern tools, by men of experience and with the ability to coordinate geology, geophysics, and all the host of technical data now available, and with the imagination necessary to visualize geological history in terms of oil and gas accumulation? Nearly every company has prospects by the dozen such as this, just waiting for a fresh viewpoint, a re-study, or a more experienced attack to transform them from something of merely historical interest into something of potential future worth.

[*To be continued in an early issue*]

[3] Frederic H. Lahee, Wildcat Drilling 1941 with Comments on Drilling Rate, Bull. Amer. Assoc. Petrol. Geol., Vol. 26, pp. 969-982.

[4] L. R. Laudon and A. L. Bowsher, "Mississippian Formations of Sacramento Mountains, New Mexico," Bull. Amer. Assoc. Petrol. Geol., Vol. 25 (No. 12) pp. 2107-2160 (Dec. 1941).

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[6] N. W. Bass, "Origin of the Shoestring Sands of Greenwood and Butler counties, Kansas," Bull. 23, Kans. Geol. Sur., Sept. 1936.

# Mid-Continent Reconditioning Practices Entering New Era

## PART 3

### Means of Reconditioning Wells to Establish Selective Withdrawal and Thus Conserve Energy or Reduce Lifting Expense Through Reduction of Free Gas or Excess Water Production

By L. E. ELKINS, R. H. SMITH, L. F. PETERSON, and P. P. MANION, JR.
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**THIS is the third and concluding installment of this article. The first part, published March 29, 1943, contained a general introduction to the series and then took up the problem of eliminating extraneous forces and their restrictive action on the normal flow of oil and gas. The second installment, published April 5, 1943, was devoted to the problem of increasing the drainage efficiency of a well by either extending its vertical or lateral sphere of drainage.**

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DURING the natural evolution of petroleum technology, the problem of proper use and conservation of reservoir energy has gradually advanced to a front-line position. Although conservation usually is found enveloped in studies of the reservoir as a whole, the individual well is the means through which conservation must be achieved. The flow or fluid into and from the well results in an expenditure of energy which, in many reservoirs, is at least partially irreplaceable.

Therefore, the problem of selective withdrawal is one which has rapidly come into focus. In reality, selective withdrawal can be applied in two general ways. It can often be applied to a reservoir as a whole, that is, oil or gas production may be restricted to certain areas in a field in order to limit water or free gas production, an excess of either often representing inefficient use of reservoir energy. This type, to be effective, requires unitization or some type of cooperative operation.

The other type of selective withdrawal is confined to the individual well and to be realized, frequently requires complex workover operations.

**Water Shut Off:** Of the two fluids, gas and water, which are usually in order for exclusion, let us first consider the water. Why shut off water? Its reduction or elimination may be instrumental in lowering lifting costs. The presence of water in a highly permeable zone in a well may limit the degree to which the flowing reservoir pressure can be reduced and thus leave a tighter zone depleted to a lesser degree; shutting off this type of water should increase oil productivity as well as reserves. The problem of salt water disposal may add the incentive. In some reservoirs, the production of excess water may be detrimental to the reservoir as a whole and a water penalty may prove the incentive to plug it off. In any event, if it is to be plugged off, its source must first be established.

Water originating in the pay section should, in the majority of cases, reach the well somewhere in the lower portion of the section penetrated. This is to be expected because of the initial distribution of oil and water in a reservoir, and because gravitational forces, throughout the producing life, tend to keep water below oil. However, the permeability profile, particularly in a stratified section, may cause an irregular water encroachment front which will result in water entering wells from intermediate, and even top, positions in the pay section penetrated.

After the point, or points, of water entry is located, then it would be desirable to determine if there are other permeable zones penetrated which are not primarily water producing zones. If there is no permeable section other than that yielding the water, then eliminating the water might also eliminate the oil production.

The problem of locating exact points of water entry into a well is one which is not yet completely solved, but the increasing need for such a service will probably result in development of an instrument to meet this need. The Dale photoelectric cell has found application to some extent but the required conditioning of the well with mud or some other opaque fluid heavier than salt water plus the required bailing between alternate runs with the instrument proved quite expensive and sometimes hazardous. The lowering of an electrode into a well conditioned with a liquid of relatively high resistance has permitted the location of salt water entry (low resistance) after alternate surveys between intervals of bailing.

A third method, one recently patented and in the process of development, stipulates that a series of stations be placed opposite the penetrated section. After the well is conditioned in one way or another, fluid flow into the well is effected. The fluid characteristics (they might be resistivity, translucency, thermal conductivity, or any other measurable characteristic) are measured practically simultaneously at each station and at specific periods. Thus, the nature of the fluid influx may be determined. This may or may not be the answer, however, any determination of this nature will either be complex or will require a long period of time for a complete survey.

In open hole, and in sections where electrical logs are a measure of the type of fluid content, they have served quite satisfactorily in locating sands flooded out by water.

There are also mechanical means of selectively testing possible water producing zones. This technique involves the use of packers and generally requires relatively long testing periods. In this respect, the use of a caliper survey in open hole may aid in selecting packer points; and in many types of well workovers, the knowledge of the actual well bore diameter may spell the difference between success and failure.

There has been considerable effort, and with some degree of success, to

develop a workover technique which will automatically and selectively place a plugging agent in the water producing zone. This development implies that the more permeable zone or zones will be delivering a higher percentage of water to the well than will be the zones of less permeability. This technique may have considerable application if it can do successfully and automatically what other processes can do with positive mechanical control.

The problem of excluding bottom water is sometimes simple, but quite often complex. If the producing section is divided into two or more zones by impermeable streaks, bottom water may not be difficult to plug off. If there is continuous vertical permeability in the producing formation, it may be impossible to shut off water or at best, a complex type of workover is required if success is to be obtained. Once the water is located and the permeability profile is measured or properly determined from well data, the mechanics of shutting off the water can be considered.

Generally speaking, the problems of the Mid-Continent area develop in "open hole." This is so, primarily because of the consolidated nature of the formations encountered, and setting casing through pay zones is not general practice except in particular fields. In some types of producing sections, it may be necessary to caliper the well bore before selecting the method of plugging. If the open hole is irregular in diameter or if it is larger in diameter than the casing string, such knowledge may often forestall trouble and in many cases may alter the mechanics of working over the well. The use of cement, including special cements such as "gypsum cement," is the most recognized means of shutting off bottom water. It may be applied in several ways and specialized technique has been developed to meet the specific requirements of different areas.

In addition to cement, certain resins have been developed as plugging agents. This type of agent is injected into the water zone as a fluid which later sets up as a solid or semi-solid and thus eliminates or restricts the flow of water through the zones contacted. Although not used too extensively at present, advancement in the technique of determining accurate physical characteristics of the pay section and actual location of oil and water productive zones may open up a wider field for agents of this nature.

The use of packers, lead wool, etc., have their application and are quite often employed when conditions require.

Cases Nos. 13, 14, 15 and 16 will serve to illustrate some of the different problems encountered in shutting off bottom water.

Case No. 13 is presented to illustrate one method of plugging off bottom water. If the shale break were not present, this job would have been a failure. Any means of sealing the well bore opposite the shale break would have been successful. Without the shale break, water would cone up through the sand around the plug in the well bore because in sand, cement apparently will not enter the natural pore spaces.

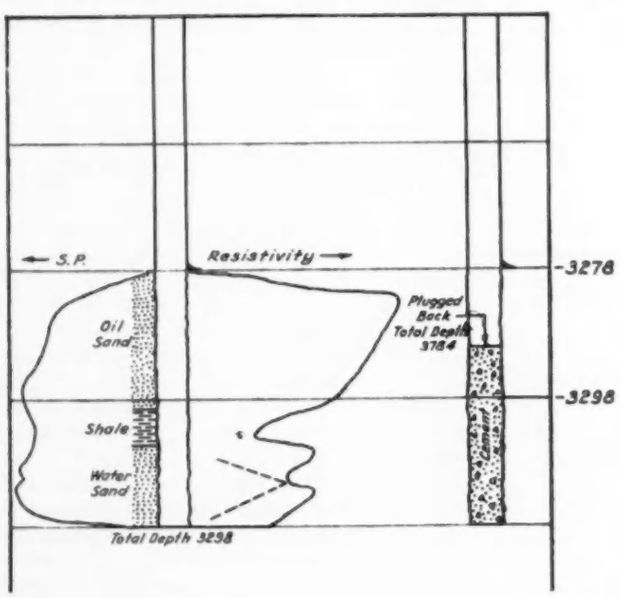
Case No. 14 is illustrative of conditions where an extraordinarily active water drive through cavernous limestone porosity has prevented effective drainage of relatively tight zones. The technique used in plugging off the cavernous zones requires careful control. The cement must be balanced in allowing it to gradually build up resistance so that a fill-up in the well bore can be obtained. When the relatively permeable zones are plugged off, the tighter zones may be more effectively produced.

Case No. 15 shows a typical problem concerning plugging off water where a relatively thin oil column overlies a thick water section in a reservoir in which the distribution of permeability is such that water coning is the source of trouble. To get a shut-off or successful restriction, the cement must enter the water saturated section and, in effect, create a permeability shield surrounding the well bore above a point in the section below which most of the water has come. Note in this job how the well was drilled deeper and acidized so that the cement shield could be placed in the path of the water cone.

The same objective could be accomplished by placing of any permeability

## MECHANICAL CONDITION OF WELL

| BEFORE OPERATION | | AFTER OPERATION | | |
|---|---|---|---|---|
| | | | 1 Month | 9 Months |
| Oil | 20.51 Bbls. | Oil | 21.64 Bbls. | 21.5 Bbls. |
| Water | 3.83 Bbls. | Water | 0.00 Bbls. | 0.0 Bbls. |




### CASE No. 13

**To Plug Off Bottom Water in Sand Reservoir With Very Active Water Drive. Water Located by Electrical Log. Shale Break Needed If To Be Successful**

**OPERATIONS:**

1. Killed well, spot good mud over open hole.
2. Run electrical survey to locate water producing interval and shale streaks.
3. Place sufficient cement on bottom to come up above 1st shale break above water.
4. Elevate tubing above cement top, apply bradenhead squeeze pressure of approximately 600 pounds for 5-6 minutes. (No appreciable cement enters sand.)
5. Lower tubing to desired cement top and, by reverse circulation, cut out excess cement.

**CONDITIONS:**

Very active water drive, porosity approximately 25 percent, permeability 1000-5000 millidarcies.

sealing medium in the water saturated section.

Case No. 16 is presented to show where the lack of a permeability profile caused a workover which otherwise might not have been performed. However, it does illustrated how a water locating device was employed. Establishing a permeability profile plus the accurate location of water entry points will go a long way to more successful water shut off work.

The problem of excluding intermediate or top water becomes complicated for two reasons, namely: (1) Its exact point of entry is not so easy to determine, especially so if the determination must be limited to "cut and dry" technique, (2) The means of shutting off the water must be of such nature that the well bore passing through the water zone will be entirely open so that lower pays may be produced.

The location of intermediate water can be determined using technique involving the same principles as employed in defining the limits of bottom water entry. These principles need not be repeated here.

Even if the intermediate or top water is accurately located, its exclusion may prove quite trying. Probably the simplest method is that of cementing a liner through the water zone. If the oil string of casing is of sufficient diameter to permit this operation, it at least is the most practical and sure way of providing selective withdrawal from zones below the water producing section. It may or may not complicate the matter of producing oil zones above the water horizon. If the porosity behind the liner is cavernous to such a degree that cement will enter the oil section, it may be necessary to resort to expensive methods to restore production from a cemented section. Such a situation may require a great number of perforations followed with acid, or it could require milling out the liner opposite the pay, underreaming, acidizing and possibly shooting. If the cement will not enter the porous zones and the section is reasonably permeable and uniform in vertical distribution of porosity, no complications should develop; however, if the section is relatively tight and the vertical distribution of porosity is spotty, the normal perforating job may not be satisfactory even though no cement enters the pay section.

If a liner cannot be cemented through the water zone, consideration is usually first given the formation packer. The packer can often be set below the offending zone and selective withdrawal directed to the lower zone. One could conceive of setting two packers, one below and one above the water zone, and producing the upper zone in the annulus, or possibly, under certain conditions, it might be desirable to provide tubing perforations above the top packer so both upper and lower oil zones could be produced through the tubing. Here again, the caliper survey can aid considerably in obtaining a successful workover. If it is impossible to get a complete shut off with a packer and the fault is in the packer seal, it is often possible to inject a substance in the annulus which will settle down in the well and accumulate around the packer. It will quite frequently form a bridge and restrict, if not completely eliminate, fluid travel around the packer. A mixture of fibre-laden mud has proven successful in some areas; however, there are other substances such as flaked cellophane, cottonseed hulls, and any other sort of semi-plastic but pumpable mixture. Also, golf balls, canvas strips and similar materials have been used in certain instances.

Another possible method of restricting or eliminating the influx of intermediate water or top water requires the selective injection of a permeability seal into the porous section yielding

### Case No. 14

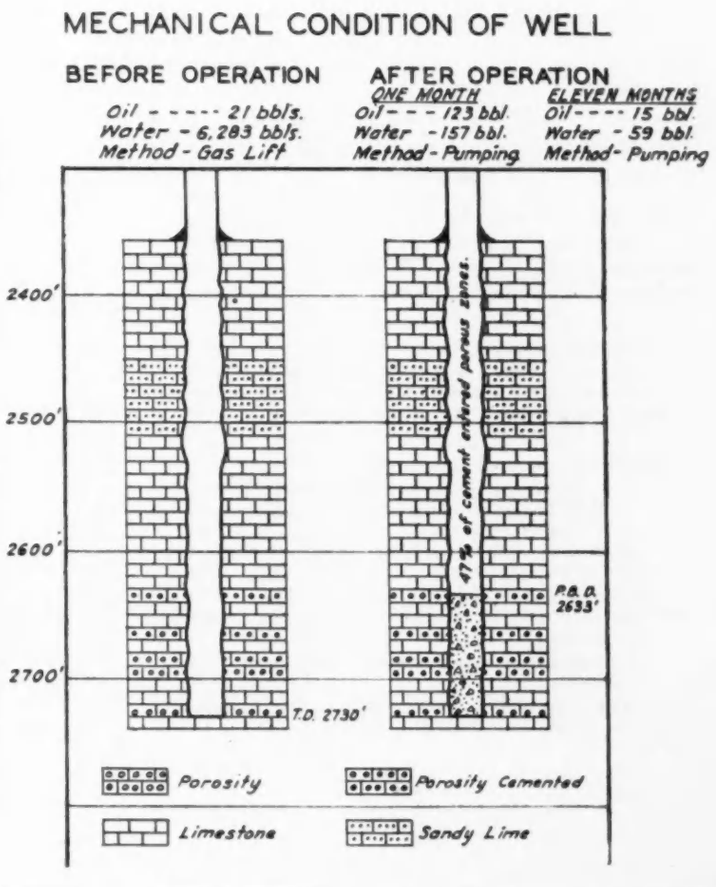
**To Shut Off Water from Extremely permeable Strata with Cavernous Porosity (Usually Active Water Drive) So That Relatively Tight Zones Can Be Produced.**

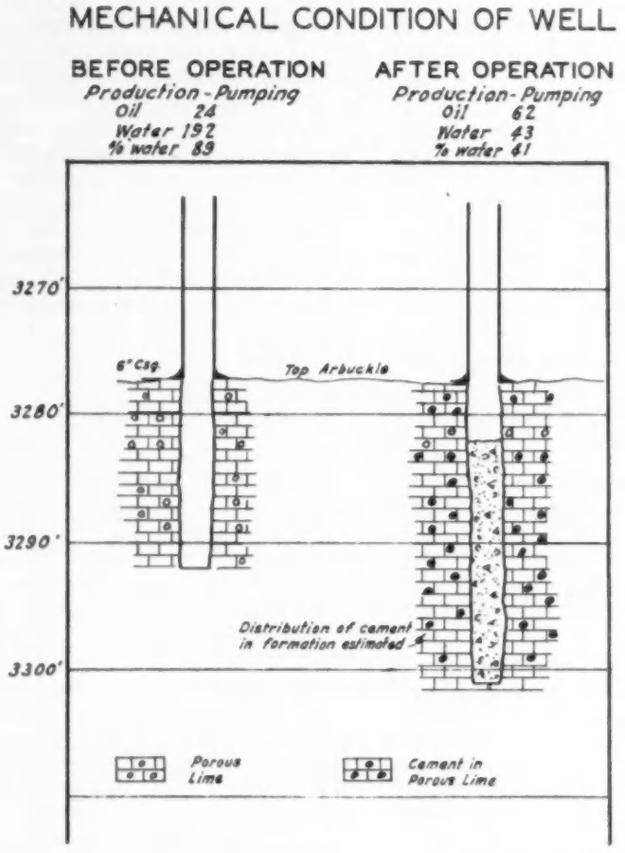
**REMARKS:**

**Usually active water drive prevents reducing flowing bottom-hole pressure sufficiently to flush out tighter zones. Specific requirement is that cement will enter, at least to some degree, the extremely permeable, cavernous porosity.**

**METHOD:**

1. **Run caliper survey to determine the volume of the open hole.**
2. **Jet the walls of the well bore to provide a clean surface for securing a bond with the cement.**
3. **With the tubing just off bottom, pump in cement until fillup begins to occur. This is indicated by a rise in fluid level in the casing as determined by fluid-level measurements.**
4. **Volume of cement entering porous zones at any one interval can be partially controlled by varying rate of cement leaving tubing.**
5. **As cement raises to desirable height, tubing is also raised and excess cement is recovered by reverse circulation.**
6. **Exposed pays can be tested and acidized if necessary. Unexposed pays can be tested after squeezing off upper pay zones and reopening lower zones with acid jet gun.**






## CASE No. 15

**One Method of Restricting Bottom-Water Production in a Formation with Cavernous Porosity with a Distribution Such That the Vertical Component of Permeability Will Approach or Exceed That of the Horizontal.**

RESERVOIR CONDITIONS:

Arbuckle dolomite, cavernous porosity, no appreciable gas in solution, water encroachment in general from bottom, very active water drive, very susceptible to water coning.

INITIAL COMPLETION:

September, 1937. Potential 2440 barrels per day after acidizing with 2000 gallons.

WORKOVER ATTEMPTS:

First: Dumped cement back to 3284 feet—failure, no reduction in water production—cement must enter porous zones.

Second: a. Drilled out plug and deepened to 3301 feet, acidized with 1000 gallons.

b. Set retainer 15 feet above casing shoe.

c. Acidized with 1000 gallons.

d. Squeezed 71 sacks through retainer, 61 sacks going into formation; 1900 psi final pressure.

e. Plug drilled out to 3282 feet with cable tools. No fill up prior to this depth.

f. Acidized with 300 gallons.

## CASE No. 16

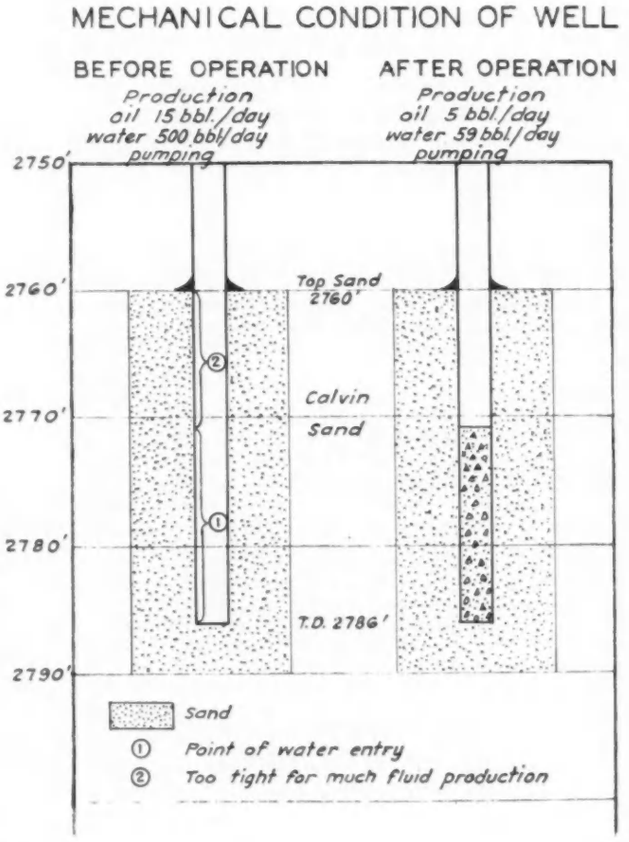
**Plug Off Bottom Water After Definitely Locating Its Point of Entry but Lack of a Definite Permeability Profile Resulted in Failure to Develop Commercial Production.**

CONDITIONS:

Active water drive—well could not be pumped down (with equipment installed) to reduce flowing bottom-hole pressure below 516 psi; static pressure 795 psi.

OPERATIONS:

1. Salt-water-entry point located by spotting fresh water in bottom of well, producing well and measuring resistivity changes of fluid entry at several stations 5 feet apart. The resistivity decreases when salt water enters.
2. Well plugged back with cement to top of salt-water-entry point. Plugged by dumping cement with bailer. Left 11 feet of sand exposed.
3. Production test showed upper 11 feet too tight to produce.
4. Had permeability profile been known, workover would have been forestalled.



water. The well bore must be left open or any plugging material must be removed from the well bore after the injection has been accomplished. The two main obstacles to this type of operation are: (1) Selection of necessary materials for sealing permeability, and (2) Complex mechanics of forcing the medium into the offending zone.

Cement can be successfully injected or forced into some types of porosity (such as cavernous lime formed by solution action, etc.) but in sands and limestone with a low order of permeability, cement appears to remain at the face of the formation with little or no penetration. Thus, the redrilling of the well through the cemented zone would remove the plugging agent and very little, if any, benefit would be realized. Cases Nos. 17 and 18 have been selected to show some of the problems that develop when trying to shut off intermediate water.

Case No. 17 is typical of the situation that might exist in a stratified lime reservoir where edge water moves in through the more permeable zones. In this instance, the classification of the waters was based upon mineral analysis. Note also the successful application of a packer seal treatment.

Case No. 18 is prepared to illustrate the mechanics of shutting off intermediate water by plugging the actual formation porosity rather than restricting the travel of water through the well bore. Although in this instance the water is in the bottom section of the well, the principle is illustrated. Very little cement went into the water formation; but when the cement plug was drilled, practically all the previous 2000 barrels of water per day had been shut off. This is the typical application which may have a valuable place in plugging intermediate zones producing either excess gas or excess water.

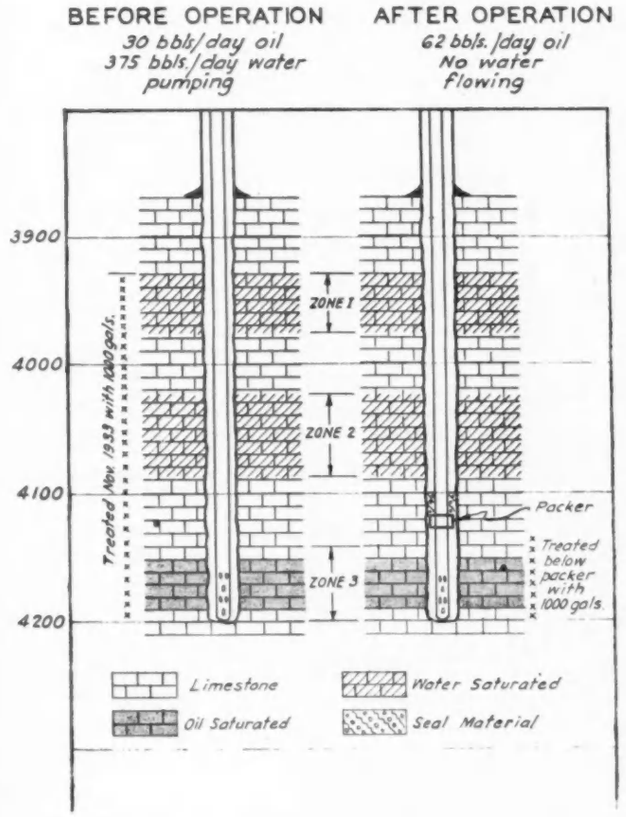
**Gas and Its Exclusion:** The motive for excluding excess gas may be twofold: (1) )To conserve reservoir energy, or (2) To save the gas for its own value; or both. It is not difficult in this day and age for an operator to realize that he is producing free gas. Free gas, for the purpose of this paper, is defined as that gas produced with each barrel of oil which is in excess of the normal solution ratio (gas dissolved in a barrel of oil) at the existing reservoir pressure. This excess gas may have had as its source an original free gas cap or it may have been vaporized from the oil during a period of pressure decline forming a free gas phase in the reservoir. Or in gas drive, repressuring, or pressure maintenance projects, the free gas from that source may prove quite a problem although at the same time supplying a valuable secondary source of energy.

The problem of reducing free gas production is sometimes simple but quite often complex. Generally speaking, gas will be confined to the upper portions of the section; yet in extremely stratified sections it can and probably does have a number of points of entry.

Gas, like water, must have its point of entry determined if it is to be most effectively shut off. The initial gas-oil contact in a reservoir with a free gas cap can often be fixed at a certain datum by core analysis or by selective testing. If such datum can be established, it will serve for use in governing reconditioning work in the earlier life of the pool, but in later life the contact may vary considerably from one part of a reservoir to another and often times the individual well becomes a special problem in itself irrespective of nearby wells.

Probably the most recognized method of actually locating the point of entry of free gas into a well is by observing the characteristics of a temperature traverse in the well. Such a traverse can be run by using the tubing as a ther-

## MECHANICAL CONDITION OF WELL




### CASE No. 17

**Packer Used to Selectively Produce Lower Oil Pay With Upper Pays Suffering from Water Encroachment.**

CONDITION OF WELL:

Well produced 80 percent water on regular schedule.

WORKOVER PROCEDURE:

1. Water identified as zone 1 and 2 by water analysis.
2. Zone 1 and 2 defined for subject well by correlation.
3. Packer point picked by drilling time below zone 1 and 2 and above zone 3.
4. Anchor type formation packer set at 4130 feet.
5. Tests indicated leakage of water by packer.
6. Packer-seal treatment applied to top of packer in annulus.
7. Well treated below packer with 1000 gallons of acid.
8. Well tested 75 barrels of oil per day and no water, flowing.

NOTE:

On the most recent production test this well was producing 0.3 percent water, 9 years after performance of this work.

mometer well and flowing the well through the annular space. As the gas stream converges on the well and expands through pressure reduction, it cools and tends to reduce the temperature of the formation and other fluids it might contact. The cooling anomaly on the temperature traverse therefore serves to aid in selecting the entrance of free gas. Solution gas, because of its relatively small volume (at bottom hole conditions, most of the gas is still in solution and is released as the oil moves toward the surface), has very little effect on the temperature traverse.

Selective testing with packers or their equivalent would prove satisfactory in locating gas zones if the well bore is sufficiently uniform in diameter for their use, however, once a well is completed the temperature survey is usually the least expensive.

Once the gas is located, its exclusion can be considered. In general, there are two principles which can be followed, namely: (1) The use of packers or liners, or (2) The injection of a permeability seal into the gas zone. Sometimes in special cases, free gas can be excluded from production by setting tubing near the bottom of a well and producing at such a low pressure drawdown that the tubing inlet will remain submerged. This latter type of control is usually restricted to thick oil producing sections with extremely high permeability.

Generally speaking, the problem of shutting off free gas production is the same in principle as shutting off top or intermediate water. Yet certain differences prevail. For example, the presence of intermediate water is almost a sure indication that the formation immediately below the water entry is relatively impermeable. As such, the successful cementing of a liner or setting of a packer opposite this tight zone will keep the water away from the lower oil pay. With gas, the absence of a tight or impermeable streak immediately below its point of entry can often be expected. Thus, a successful shut-off in the well bore might not plug the vertical channels of permeability beyond the face of the well bore.

Therefore, as an immediate objective, it is usually desirable to set the liner or packer at the first impermeable section below the base of free gas entry. This may require shutting off some of the oil section, but it can be cleaned up at a later date after the major oil reserves have been recovered. In reservoirs substantially under volumetric control and where free gas is quite a problem, there comes a time, as the reservoir nears depletion, that free gas enters the well bore throughout the section and the exclusion of free gas may become mechanically impossible.

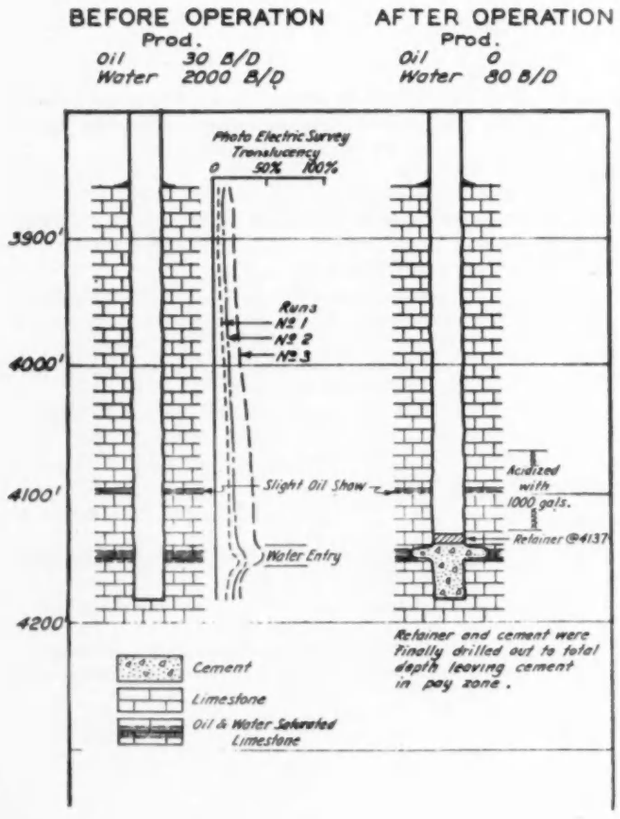
The use of packers and liners for shutting off gas has the same mechanical limitations as when shutting off intermediate water, and they need not be repeated here; although in passing, it should be stated that the use of packer sealing mixtures is probably needed to a greater degree when shutting off gas than water.

Sometimes, it is desirable to reduce free gas production from wells in which it is impossible to use packers or liners. The section may have been shot or otherwise left in such condition that a packer seal or liner seal cannot be established. There is left the possibility of injecting a permeability sealing medium into the free gas producing zone. This, as in other selective injection problems, requires a knowledge of the distribution of oil and gas saturation, permeability profile, and requires exact control of all phases of the injection process.

Cases Nos. 19 and 20 illustrate typical means employed to exclude free gas production and the results obtained.

Case No. 19 illustrates the use of a

## MECHANICAL CONDITION OF WELL




### CASE No. 18

**Cement Squeezed into Limestone Porosity to Shut Off Water. Water Was Shut Off but so Was Oil. Shows Need of Locating Oil Entrance as Well as Water.**

CONDITION OF WELL:

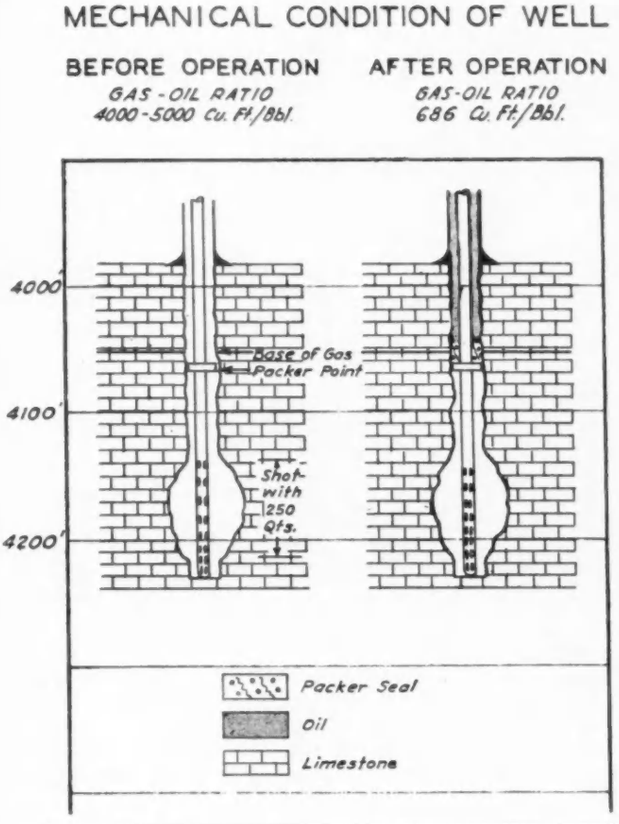
1. Well produced 30 barrels of oil and 2000 barrels of water in 24 hours.
2. Several formation packers did not reduce water.

WORKOVER PROCEDURE:

1. Photo-electric survey run and indicated water entry from 4140 to 4165 feet. The translucency was not increased above 50 percent on any run, which indicated some oil entry. This section represented the best pay section on original completion.
2. Formation cementing retainer was set at 4137 feet and the formation below squeezed with 40 sacks of cement.
3. Well tested 20 to 30 barrels of water per day, indicating upper pays as impermeable and water saturated.
4. Acidized with 1000 gallons and well produced small amount of oil for short period and then reverted to 100 percent water.
5. It was realized that oil pay was shut off by cement, so retainer and cement were drilled out to total depth.
6. Tested approximately 80 barrels of fluid per day with only a trace of oil, which was approximately the same before drilling retainer.

NOTE:

The section squeezed off had the best and only oil pay for this well.




**CASE No. 19**

**Use of a Packer-Sealing Medium to Perfect the Shut Off Between the Packer and an Irregular Well-Bore Face.**

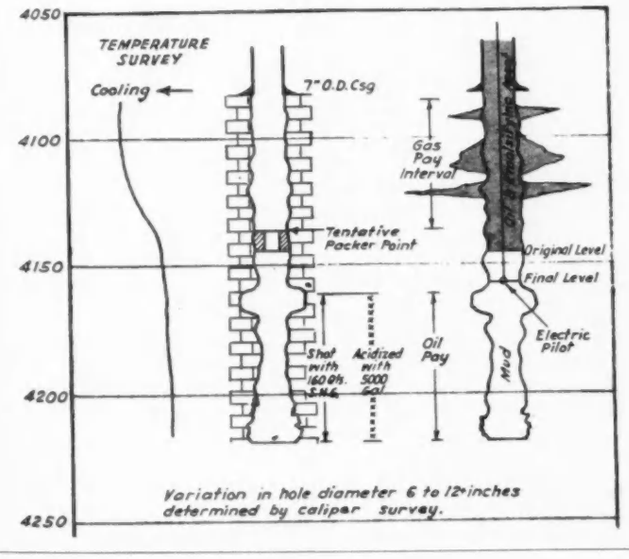
CONDITION PRIOR TO WORKOVER:
Gas-Oil Ratio 4000-5000 cubic feet per barrel.
Allowable penalized from 40 to 30 barrels.

WORKOVER PROCEDURE:

1. Temperature survey depicted gas-oil contact at 4052 feet.
2. Packer point selected by drilling time at 4066 feet. (Job performed before development of caliper survey.)
3. Anchor set formation packer run and set from 4061 to 4066 feet.
4. Well tested with gas-oil ratio of 4100 cubic feet per barrel.
5. Packer-seal treatment performed as follows:
   a. Two sacks of colloidal mud and 40 pounds of fiber shredded material were mixed with water to form 5 barrels of material.
   b. Mixture was pumped into annular space between casing and tubing under pressure of 1275 psi.
   c. Seal mixture was followed by 24 barrels of oil to pump the seal down.
   d. Well flowed at low rate while placing seal to allow material to channel through leakage fissures.
6. Well tested on 9/64-inch choke at rate of 99 barrels per day and gas-oil ratio of 686 cubic feet per barrel.
7. Allowable increased from 30 to 40 barrels, and a large saving in gas per barrel of oil is realized.

packer and the need for a packer seal in irregular well bores for shutting off excess free gas production. In a number of Mid-Continent reservoirs, particularly in the thick lime or sandy lime fields in West Texas, this type of application is finding considerable use.

Case No. 20 is presented to show a principle which can be used in shutting off, or reducing, free gas production. In this instance, an emulsion forming agent was injected into the gas zone with the thought that it would create substantial resistivity to flow of gas through the section. The use of a sealing medium of this nature eliminates the necessity of drilling out cement plugs. The mechanics of placing such a




**CASE No. 20**

**Use of Permeability Seal for Shutting Off or Restricting Free Gas Production. Sealing Medium Must Be Forced Into the Permeable zones. In This Case an Emulsion Was Used as an Experimental Test.**

CONDITION OF WELL:
Gas-oil ratio 28,544 cubic feet per barrel. Allowable penalized from 22 barrels to 4 barrels per day.

WORKOVER PROCEDURE:

1. Temperature survey taken and gas-oil contact picked at 4137 feet.
2. Caliper survey run to determine packer point. (The well had been shot and acidized from 4162 feet to bottom.) Tentative packer point, 4137 feet.
3. Mandrel indicated packer would not run through lower joint of casing, packer job could not be performed.
4. Mud blanket spotted from total depth back to 4144 feet. Top located with electric pilot.
5. 50 barrels of water pumped into the interval above top mud column at 4144 feet. Water followed by 150 barrels of oil and emulsion-forming agent.
6. Mud level fell to 4158 feet during pumping operation as determined by electric pilot.
7. Mud swabbed from well and well kicked off.

RESULTS:
Well has produced with a ratio varying between 4000 to 4200 cubic feet per barrel since workover, and has shown no tendency to increase. Field gas-oil ratio limit is 5000 cubic feet per barrel and allowable has increased to 22 barrels per day.

medium is rather unique, and such a principle as this may lead to the ultimate realization of selective withdrawals from sections shot with explosives.

### Summary

In summary, it can be stated that the oil industry is gradually entering into a period where rapid depletion of existing reserves and increasing difficulty in finding new reserves, together with government limitations on development in proven fields are such that an increased emphasis should be directed toward increasing productive capacity and available reserves through the reconditioning of existing wells.

The technique of reconditioning oil wells is rapidly approaching the stage where a minimum of guesswork has to relied upon to solve the individual problem. This has been brought forth by the initiative and coordinated efforts of oil producing companies and active service companies.

The country and the industry as a whole will benefit from applied conservation in all types of oil pools and, although conservation usually is reflected by field conditions as a whole, it must be achieved through the proper operation of the individual well. The need for keeping a well in good mechanical condition, assuring that the well will adequately participate in the effective drainage of that part of the reservoir in which it is completed, and the elimination of waste by minimizing the production of excess free gas or water from the well, are all objectives which come into the realm of reconditioning. It is believed that toward this end there is and should be a gradual shift of aggressiveness.

### Acknowledgment

The authors wish to express their appreciation to the management of Stanolind Oil and Gas Company for permission to publish this paper.

## Discussion

By C. P. PARSONS,
Halliburton Oil Well Cementing Company

Due to government restrictions which have considerably reduced the number of new wells drilled since January, 1942, production of oil from old wells becomes increasingly important as a source of power for our mechanized war effort. Oil men feel that the old wells will not be able to keep pace with the war effort over a period; also that there will be a considerable time lag between the releasing of restrictions on new drilling and the actual increase of daily production due to finding new fields and completion of new wells. Meanwhile, it is obvious that everything possible should be done to put our old wells in the best shape to carry their all important share of the load. However, this costly repair work is not encouraged by the existing low price ceiling on oil.

Aside from the economic influences, the paper on reconditioning of old wells is both important and timely. I have studied the paper carefully and feel that it presents many useful suggestions and lines of thought. It is so well prepared and practical that I will confine my discussion to extending some of the thoughts in that part of the paper which deals with excluding water from oil wells, which is in my special field.

Reference is made to the irregularities in the permeability profile of a producing formation as being the possible cause of an irregular water encroachment front. It is desirable therefore to be able to measure such irregularities. Reference is also made to the partially solved problem of locating exact points of entry of water from the formation into a well. After the point of entry is located, a method must be selected to shut the water off. The paper describes various methods which apply to this three-fold problem but the methods are threefold disconnected and only partially solve the problem. There is a new cementing technique which embodies a single, progressive and continuous operation which combines all three functions of measuring the permeability profile, finding the points of entry of water and shutting off the water, all in one continuous operation and without requiring a drilling rig. It is a technique which we have been calling "water control," and which embodies so many useful ideas, instruments and equipment that it offers many different applications in the reconditioning of both sand wells and lime wells; and the economy of operating without a drilling rig is obvious. It differs from all previous cementing technique primarily because it eliminates practically all the guess-work and the job is followed up by the cementing engineer until the oil is in the tank with the least possible amount of salt water or without any salt water.

Reference is made to cement not entering the natural pore spaces and that if no shale break is present, salt water may come up around the cement plug into the well. No reference is made to the pancake theory of squeeze cementing wherein the pump pressure opens up a space within the formation in which the cement slurry spreads out and forms an impermeable lamination, which, with the plug in the hole, shuts off the water but does not shut off the oil. If the cement slurry fingers out irregularly in the first squeeze, successive squeezes can complete the "pancake" around the well bore and hold back the water in a similar manner as a shale break.

Reference is made that in a sand with a low order of permeability cement appears to remain at the face of an oil sand with little or no penetration of the cement into the natural pore spaces. This is correct but spaces can be created as mentioned in the preceding paragraph. In addition, I would add that one of the best evidences that pump pressure opens up spaces, even in a tight sand, comes from the Bradford field where it has been stated that a bypassing effect occurs in a water drive when the pressure exceeds one pound per foot in depth.

## Discussion

By M. L. STIRLING,
Dowell Incorporated

This paper presents an excellent analysis of a number of oil well reconditioning methods that are not sufficiently recognized or used to be called accepted practices. One is impressed by the thorough study given by the author's company of past histories, analogies, and correlations on individual wells before reconditioning is attempted. This is necessary because the decision to work over any well must be based on the economic (profit) motive, and this must eliminate guesswork so far as is possible.

The author was careful in the early part of the paper to point out that his discussion was to be held to the reconditioning of producing sections to take advantage in some way of the existing reservoir energy. It was mentioned that those wells requiring a secondary source of energy being supplied the reservoir must be considered separately, although the basic problem is the same—that is, to deliver oil to the well bore which cannot be brought there efficiently and economically without reconditioning. It is recognized that wells coming strictly under one or the other of these two categories must be given different study and treatment, but it is also suggested that the methods discussed in several of the cases presented may also be utilized in studies of secondary recovery work.

Particular reference is made to case 8, the determining of permeaability profiles; Case 9, caliper surveys of well bores; Case 12, lateral drilling; and Cases 16 and 18, showing the need of locating points of both water and oil entrance into the well bore. These methods of well study would appear to have a definite value in solving the problems of water flooding and gas repressuring.

It is further suggested that there may be applications of the permeability survey secured by the electric pilot method, when correlated with porosity and saturation studies, in estimating oil reserves and recoverable oil.

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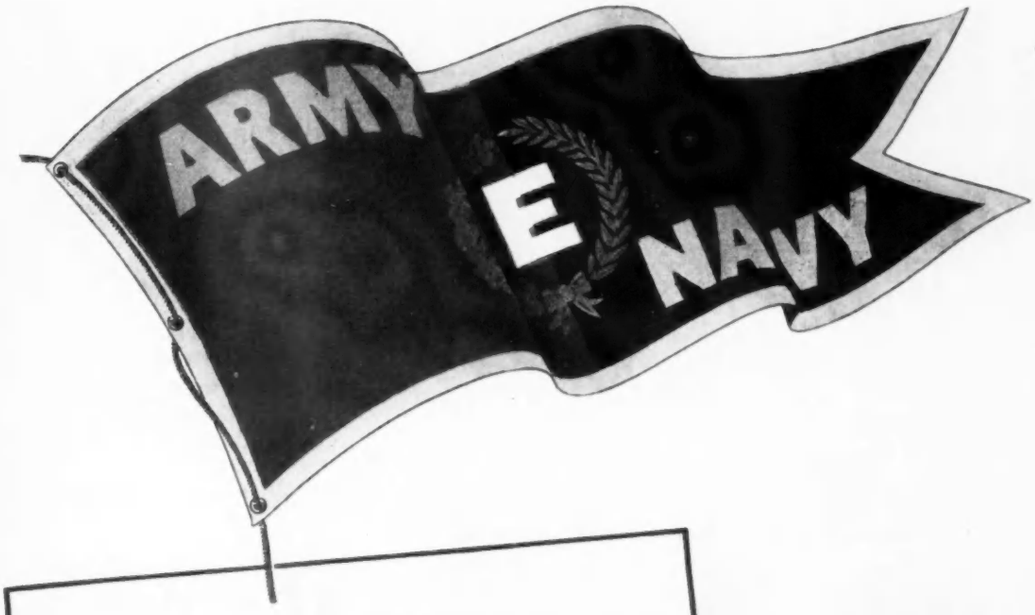


DEPARTMENT OF THE NAVY
OFFICE OF THE UNDER SECRETARY
WASHINGTON

February 12, 1943

Mr. A. I. Brainard, President
and General Manager
Beaumont Iron Works Company
1450 Crockett
Beaumont, Texas

Dear Mr. Brainard:

This is to inform you and all employees of the Beaumont Iron Works Company that the Army and Navy are conferring upon your plant the Army-Navy "E" Award for outstanding production of war materials.

This award consists of a flag to be flown above your plant, and a lapel pin, significant of major contribution to victory, for every individual in your plant.

The high accomplishment of you men and women of the Beaumont Iron Works Company is inspiring. Your record will be difficult to surpass, yet the Army and Navy have every confidence that it was made only to be broken.

Sincerely yours,

James Forrestal

**Every member of our organization fully realizes the deep responsibilities and continuing obligations that accompany this high honor bestowed upon us, and will exert every effort to be of additional service to our beloved Country.**

A. I. BRAINARD, *President*

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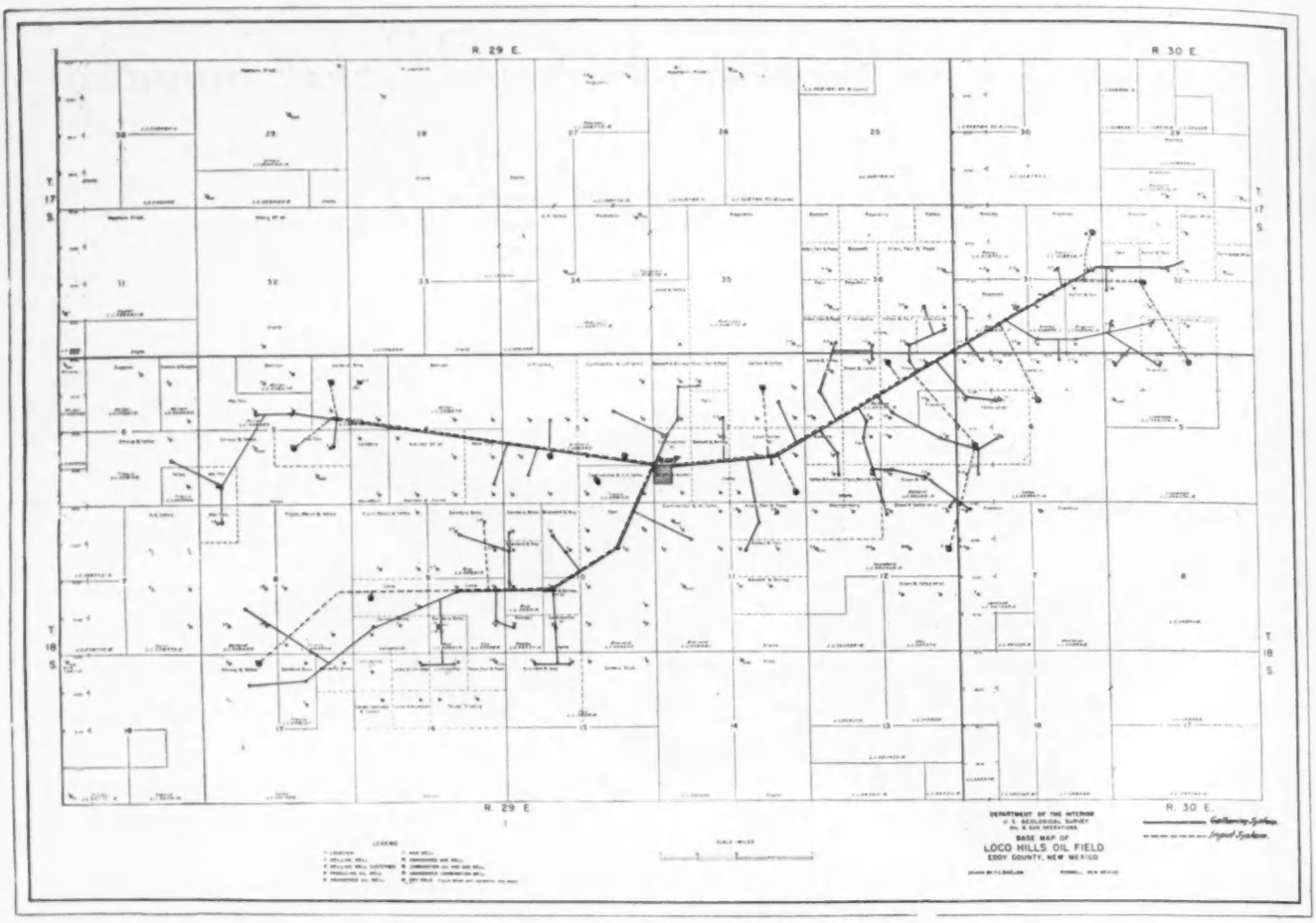


**Diagram of input and producing wells, gathering and input lines**

# Loco Hills Pressure Project Indicates Increased Recovery

**Estimates of ultimate per-acre recovery more than doubled as bottom-hole pressure-decline levels off following start of cooperative maintenance program**

By GILBERT M. WILSON and FRANK BRIGGS, Staff Writers

EARLY realizing that cooperation among themselves would mutually benefit each operator through prolongation of the life of the field, a conservation program involving a pressure-maintenance project was put into effect in October, 1941, in the Loco Hills field of New Mexico. With the exception of two operators in the field, an association of Loco Hills producers carries on this conservation program as a non-profit, incorporated organization, employing an operating staff consisting of a superintendent, engineers and clerical personnel. Since the pressuring operations were begun, the bottom-hole pressure and gas-oil ratio tests have indicated a trend toward a maintenance or improvement of these factors. The average bottom-hole-pressure curve for the field began to level off in March of 1942 and this condition has been maintained to such an extent that operators, previously estimating 4500 barrel per acre, now believe recovery will be in the neighborhood of 10,000 barrels per acre.

Loco Hills field comprises an area approximating 7000 acres on which are 184 producing wells and (with the exception of 240 acres and 6 wells) all are incorporated into the pressuring program. There are approximately 40 miles of gathering and input-gas lines serving this area: 12-, 10-, 8-, 4- and 3-inch gathering lines radiate from the plant toward the east end of the field; the west and southwest portions are served by 8-, 4- and 3-inch lines. The input-gas lines are of 4-, 3- and 2-inch. With exception of the 16 input wells, gas is collected from all wells under association supervision;

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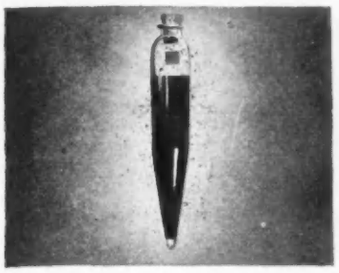

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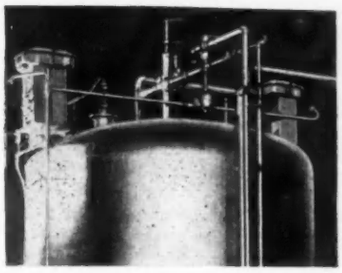

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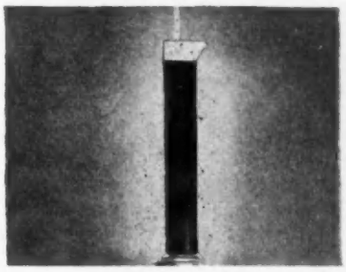

**PETRECO DOES!**

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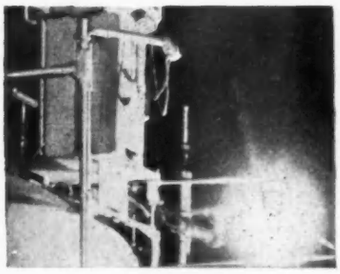

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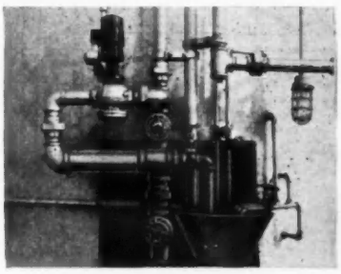

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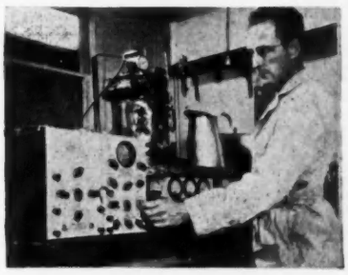

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the daily amount handled exceeding 3,500,000 cubic feet.

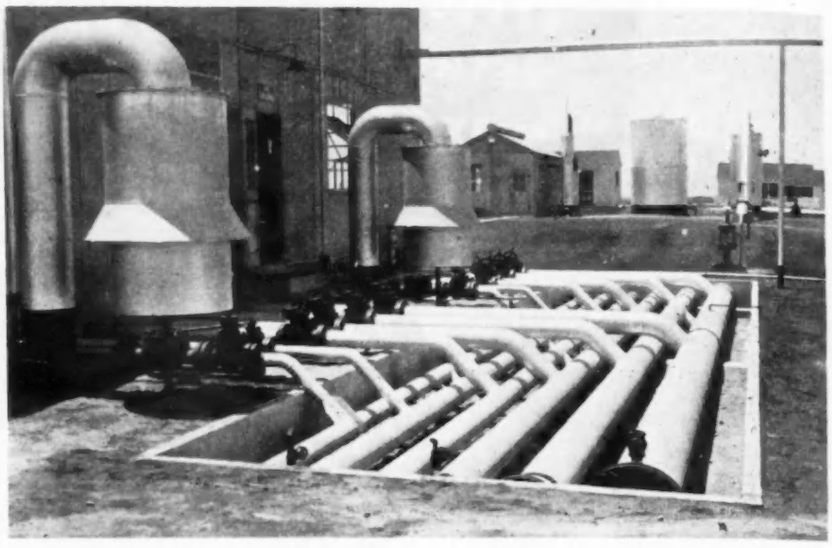
The gathering system is concentrated at the plant into a 16-inch main line that leads into the main gas scrubber. From the scrubber and through the main recording meter, the gas flows into the manifold, or header, before entering the low-compression side of two 625-horsepower compressors. The collected gases at the entrance to the plant are about atmospheric pressure; the first stage of compression raises the pressure from this point to approximately 35 pounds. The intermediate stage boosts this to 275 and the final stage compresses the gas to 900 pounds.

Primarily as a means of increasing the volume of gas handled by the compressors, inter-stage cooling is undertaken. Another good reason for the gas-cooling processes is the recovery of ½ gallon of raw gasoline for every 1000 cubic feet of gas processed. The exhaust gas from the low-stage compression has a temperature of 170° F., which is lowered to 78° before entering the second stage. The intermediate-stage discharge is cooled from 200° to 88°; the high-stage gas is discharged into the system at 280° F. without cooling.

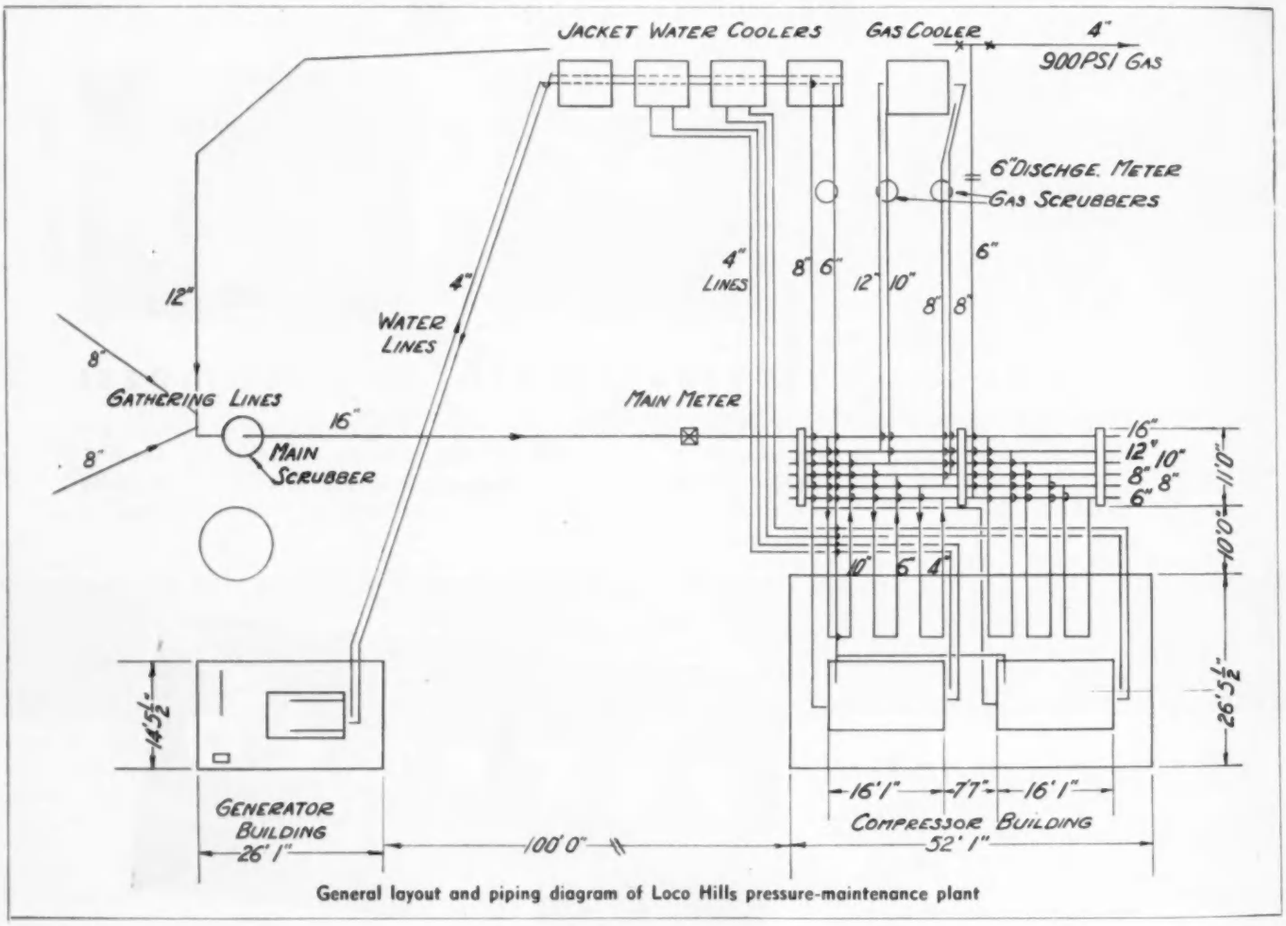
The inter-stage gas cooling, as well as the cooling of the jacket water and lubricating oil, is by means of five radiator units. Four of the units cool the water and oil, a fifth, larger than the others, cools the gas. These radiators are so set up that the cooling surface is exposed in the direction of the prevailing wind. This means that they face north to receive wind behind the fans.

The gas-cooling radiator operates with a large fan powered by a 15-horsepower splash-proof motor. The small cooling units for the jacket water are powered by 10-horsepower motors on each radiator. The electrically-driven coolers are provided with a centralized double-throw switch to accommodate wind change. Should the wind suddenly blow from the opposite to the prevailing direction, the motors can be stopped and started in opposing rotation.

Due to the extreme wind and sand conditions characteristics of this area,



Manifold of low- to high-pressure gas lines. Pipe ranges from 16-inch to 6-inch, depending upon stage of compression. Note oil-bath intake filters for engines.




General layout and piping diagram of Loco Hills pressure-maintenance plant

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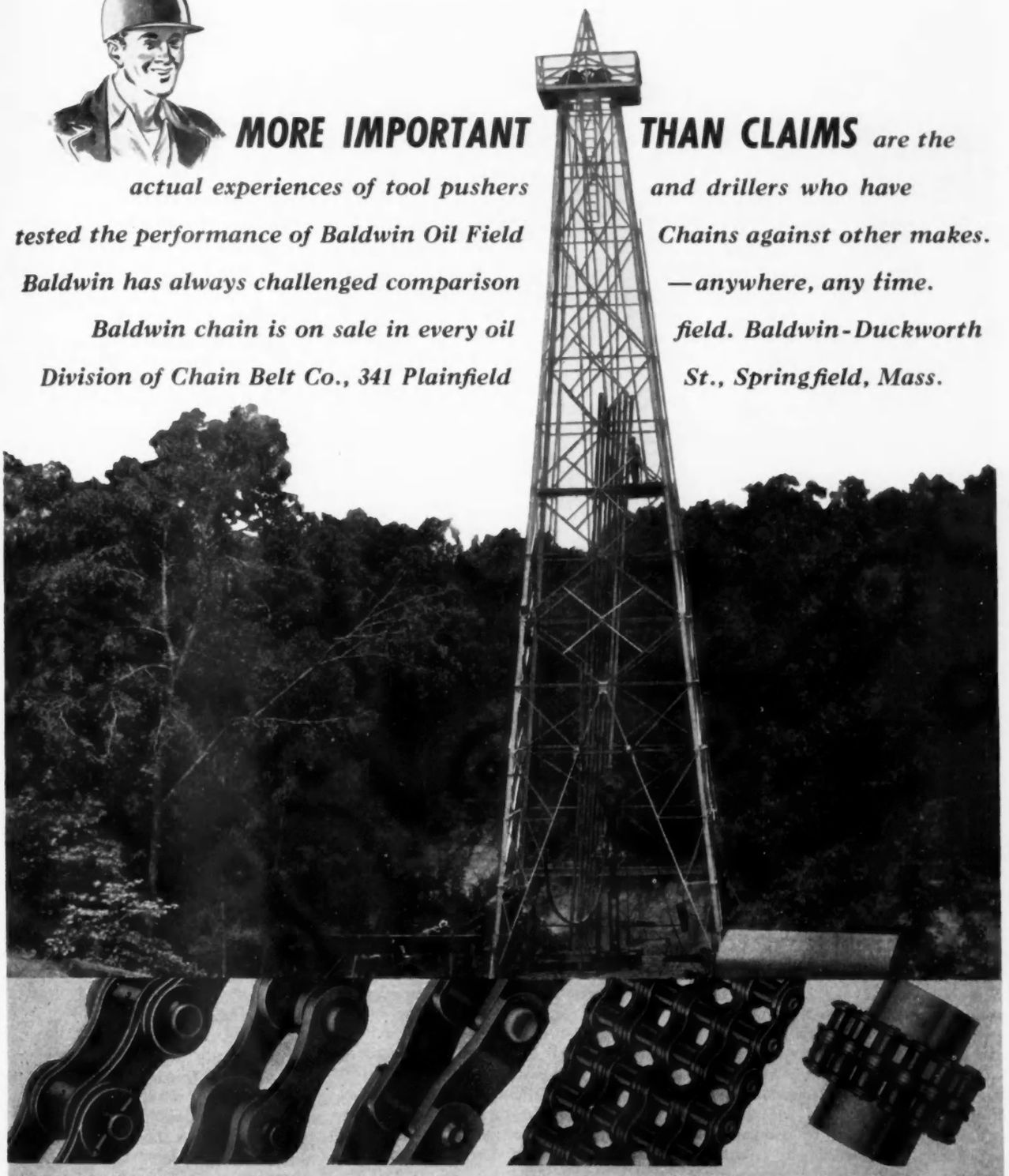

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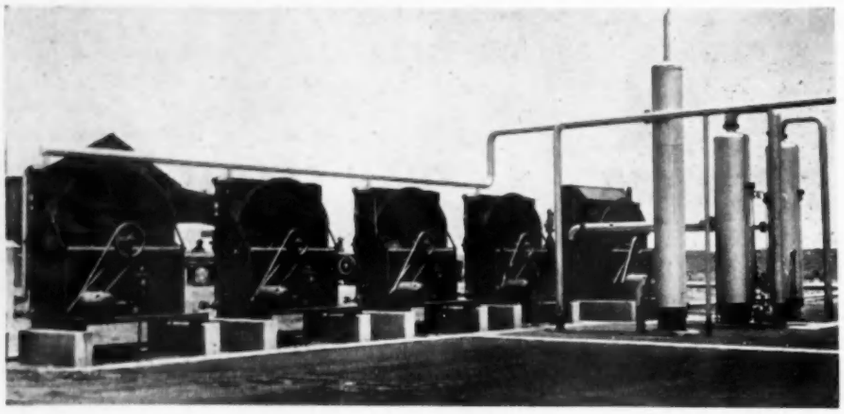

**View of water- and gas-cooling radiators. Note also three scrubbers — one for each stage of gas compression. Overhead six-inch lines are for water from engine jackets.**

an inclosed circulating cooling system is essential. In order to avoid air pockets that often occur in this type of system, an ingenious venting arrangement has been installed. This consists of a ⅛-inch riser connection between a 6-inch over head water pipe (from engine to cooler) and a water suction tank, where the system is vented. The system is supplied with pure water at all times as the use of local water (it being very hard) would form insulating crustations on the inner surfaces of the cooling system.

The electrical power requirement for the plant is generated on the location by a gas-engine-driven generator. This is a 60-cycle, 3-phase generator rated at 75 kilowatts, 480 volts; the driving engine developes 140 horsepower under the normal operating speed of 600 revolutions per minute. Inclosed in the same house as the generating plant is the "air jammer," driven by gasoline engine, for starting the gas engines that drive the main compressors. This small compressor develops pressures up to 240 psi.

The success of the whole system depends upon the ability to prevent the "freezing up" of gas passageways at points such as intake-well fittings, meter settings, etc., where expansion of the gas is prevalent. In order to keep the lines open, heaters, simply constructed but very efficient, have been installed at strategic locations.

The heater jacket is composed of large casing; welded inside is a plate segregating the burner compartment from the upper chamber which contains the medium of heat exchange. An inexpensive, heavy oil, completely covering the inclosed coils, is maintained at 450° F. by the heat from the burner below. The burner receives its fuel from the high-pressure line, a regulator and settling chamber processing it for the burner.

### Good Results

Loco Hills, discovered in 1939, produces from an avreage depth of 2800 feet. The pay thickness averages 20 feet and has a porosity of 20 percent. Although water-cut oil is produced, mainly from edge wells, no definite water drive is evident and the belief in ultimate recovery through gas drive is predominate. Originally, bottom-hole pressures ranged from 600 to 1000 pounds per square inch. This pressure rapidly declined under the daily withdrawals of 6000 to 7000 barrels of oil; the chart shows approximately 8.3 pounds per month during the period from September, 1940, to September, 1941. Until March, 1942, this rate of decline was even greater; at that point, however, the curve leveled off, due to the effect of the repressuring program.

The repressuring plant, starting operations in October, 1941, had an input-gas volume for the first 7 months of 545,359,000 cubic feet. The month of November, 1941, replaced 52,000,000 cubic feet of gas back into the formation; this was increased later to 90,000,000 cubic feet per month which represents 80 percent of the total capacity of the plant. Sixteen injection wells return the gas into the formation, handling from 150,000 to 300,000 cubic feet per well per day.

Gas-oil-ratio and bottom-hole-pressure surveys are made regularly every three months, with check ratios being taken constantly. Many high ratios have been lowered and all producers are checking their wells which actions are reflected in the generally healthy condition of the field. With the lowering of high ratios and the return of the gas to the formation, it is expected to have the area better stabilized, from which condition more average and minimum declines may be expected.

Accompanying graphs illustrate the decline in bottom-hole pressures. These results are for 114 wells, 24 of which have gas-oil ratios within 1000 cubic feet per barrel, 17 of which have ratios between 1000 and 1500 cubic feet, 18 wells lie within the ratio range of 1500 to 2000 cubic feet, 30 wells from 2000 to 3000 cubic feet and the rest of the 114 wells have ratios between 3000 and 5000 cubic feet par barrel. The figures from which the decline curves were drawn are shown in Table 1.

In checking the June survey, it was noted that 46 of the 114 wells had shown an average increase of 26 pounds per square inch in bottom-hole pressure; 17 wells had equal pressure or less than 10 pounds drop since the previous survey. The remainder (51) were still showing some decline in bottom-hole pressure; these wells were mainly two or more locations away from an input well.

The most recent survey taken in January, 1943, shows a gain in reserve pressure on 24 wells over the previous survey of September, 1942. In October, 1941, when the plant was put in operation, there were 27 pumping wells in the field. During 1942 only 2 additional wells were placed on the pump. These 2 wells were making a small amount of water. Several of the pumping wells have shown an increase in production and it is the general opinion of many of the operators that, without repressuring, many more wells would have been pumping by the end of 1942.

### Organization

Loco Hills Pressure Maintenance Association, Inc., selects a board of directors from among its membership, and at a recent stockholders meeting, all directors were reelected for a third term, thus paying tribute to the management and operation of the pressure system. The complete pressure system was designed and installed under the supervision of its present superintendent, Fred L. Jacobs. The association is headed by C. J. Dexter, president; Bert Aston, vice president, and Fred Brainard, secretary-treasurer. C. A. Aston, consulting geologist, instigated the original idea, and Sam Sanders was general contractor on the project.

**TABLE 1**

| No. of Wells | GAS-OIL RATIOS | AVERAGE FOR BOTTOM HOLE PRESSURE SURVEYS | | | | | |
|---|---|---|---|---|---|---|---|
| | | Sept., 1940 | Sept. 1941 | Mar., 1942 | June, 1942 | Sept., 1942 | Jan., 1943 |
| 24 | Under 1000 | 749 | 676 | 699 | 697 | 684 | 683 |
| 17 | 1000-1500 | 777 | 661 | 599 | 599 | 529 | 472 |
| 18 | 1500-2000 | 774 | 640 | 566 | 575 | 522 | 504 |
| 30 | 2000-3000 | 757 | 657 | 549 | 522 | 461 | 420 |
| 25 | 3000-5000 | 731 | 560 | 451 | 443 | 342 | 320 |
| Average | of 114 wells | 741 | 630 | 556 | 554 | 507 | 480 |

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**Advantages of the EXACT S-P-A-C-I-N-G and GREATER PENETRATION of McCullough Gun Perforators on other important jobs!** Accurate depth measurements—Positive location of Gun at desired shooting point—Proved safety to the well and men—Positive firing control—Operated by experienced Oil Men—Guns fired either electrically or mechanically—Gun sizes for every requirement from 2-inch tubing to largest size casing.

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| VICTORIA, TEXAS | TYLER, TEXAS | LAKE CHARLES, LA. | CASPER, WYOMING | AVENAL, CALIF. |

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# Californians Think Idea of Pipe Line from West Texas Unsound

By E. S. BUNCH, Staff Writer

ALL the angles necessary for a first-class controversy are present in the "on again, off again" proposal for a pipe line from West Texas to the Pacific Coast. The project, first conceived as a safeguard against war exhaustion of California oil reserves to a point that might be dangerously low in relation to needs of Pacific naval and military operations, has been given the serious consideration of many war agencies. Studies of the various committees have developed sharply conflicting conclusions.

### California Not Short

To begin with, certainty is lacking of the premises on which the whole idea is based; that is, no one yet has established it as even a reasonable expectation that California will run short of oil. Much has been written about the state's dwindling storage, the heavy drainage upon existing fields during a period of meager new discoveries and the soaring demands for fuel oil, but California week in and week out continues to produce about one fifth of all the nation's crude without extraordinary effort.

Admittedly, development of new production capacity as well as discovery of new fields in California is lagging; and the curve of natural decline must be running its inevitable course downwards. But before getting unduly alarmed at this situation it must be taken into consideration that the state's crude resources still represent a vast supply for the present and the nearby future; and also a fortuitous turn in wildcatting at any time might, in a matter of months, bring in a flood of fresh reserves. Through long years past California producers stacked up huge storage, the remaining bulk of which represents a formidable backlog. Again, proved patches of oil ground remaining undrilled in old fields aggregate thousands of acres. The move to develop these already is under way.

Because four years passed without a new discovery of importance resulting from the expenditure of many millions in wildcatting the fear gained ground that all the state's main oil fields have been found—or something approximating that doleful view. Those familiar with the half-century history of wildcatting in the state, however, are not at all convinced. Too often they have seen the discovery cycles swing back and forth. Only a few weeks ago the four-year record of ineffectual exploration suddenly was brought to an end by the discovery of the Guijarral Hills field in Fresno County, which engineers immediately conceded could represent an addition to reserves of 20,000,000 barrels or more. And immediately operators realized that at least 100 square miles of adjacent territory contains just as much promise for such production as did the tract upon which the discovery was drilled.

All this gives some suggestion of the background that looms up before the California oil producer when sombody suggests that oil from somewhere else be brought to his state to supply the market he regards as his very own. A pipe line capable of pouring a constant stream of Texas and New Mexico product into this market is a dread thought. Once in existence it would be there in flush days as well as lean, a potentiality for market disruption of incalculable influence.

### Self Interest

Needs of the nation for war, however, are the first consideration. Self interest of California oil men, already being unhesitatingly sacrificed by them wherever good of the war effort is at stake, would be thrust aside in a demonstrable need for such a pipe line. But they are so certain that no such need now exists or might develop over some years ahead, however, that the project faces their most strenuous opposition.

Naturally a diametrically opposite viewpoint is held in oil-producing regions around what would be the other end of such a pipe line, particularly in New Mexico and West Texas. There productive capacity is in abundance, but much of it is now unavailable for war needs due to the baffling problems of transportation created by tanker shortage. If California reserves may be unduly depleted and even threatened with exhaustion, they argue, it not only is in the interest of the war effort but also a service to sound conservation practice, to serve the Pacific military needs from the overabundance of their supply.

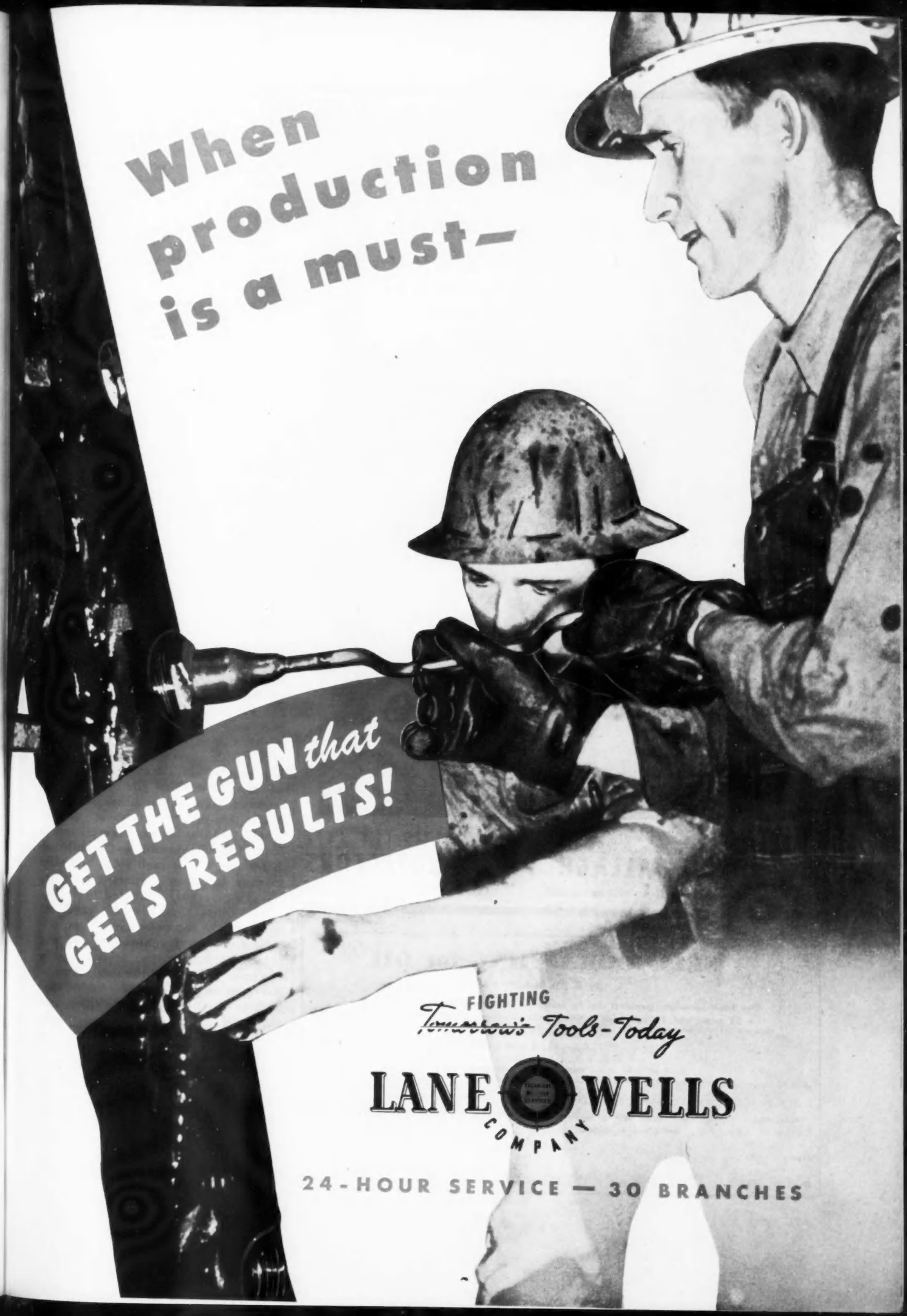
To add to the complexities of the problem, a recent discussion raised an international question along this line: Assuming that more oil than California could supply were needed in the Pacific theater of operation—in the absence of the Texas-to-California pipe line—would it not be probable that Venezuela would get the call for emergency shipments? Thus foreign fields would be favored to the exclusion of domestic producers.

### Making Protests

In Los Angeles the disposition until recently has been to ignore the proposal, to treat it as too preposterous to merit serious consideration. But as it has come to be accorded attention by one after another of the powerful war agencies and special committees, concern as to what might happen has gained ground, and leaders of the industry are stating the California position, and in some cases making vehement protest.

On the surface it would appear that the Californians won an important first round in the form of an expression of disapproval of the proposal by the Petroleum Administration for War. Ralph K. Davies, deputy administrator, voiced this viewpoint as follows:

"I can not visualize the pipe line that I have heard discussed in Washington that would run from Texas and New Mexico to California. It just does not seem possible to me that anything of that kind can be necessary. I have faith that the oil industry of California will be able to do the West Coast job, and that somehow or other out here you will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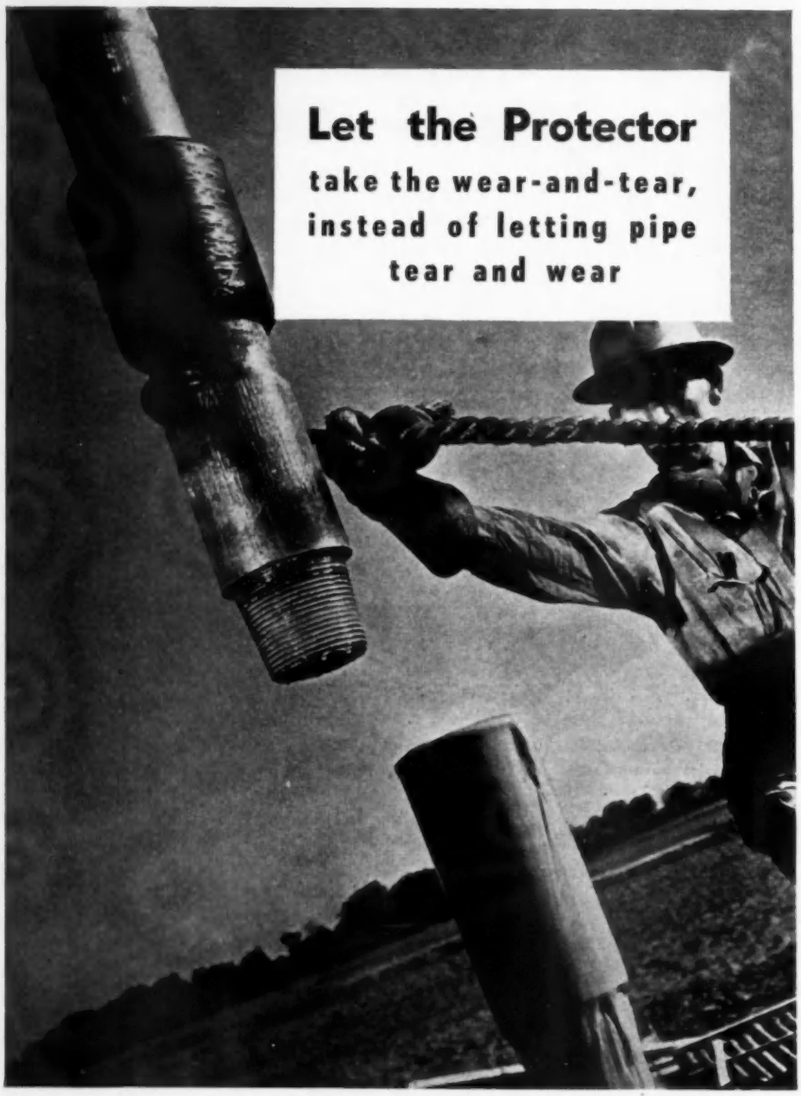


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find more oil, and that you will be able to produce oil in sufficient volumes completely to fill the war order."

An inkling as to what may be expected in the way of an open conflict between Mid-Continent and California interests, the Los Angeles *Times* recently took cognizance of promotion of the pipe line idea by flatly branding it as a brain child of Texas operators.

Not too logically, and certainly with scant heed to what home consumers might think about it, the *Times* protested:

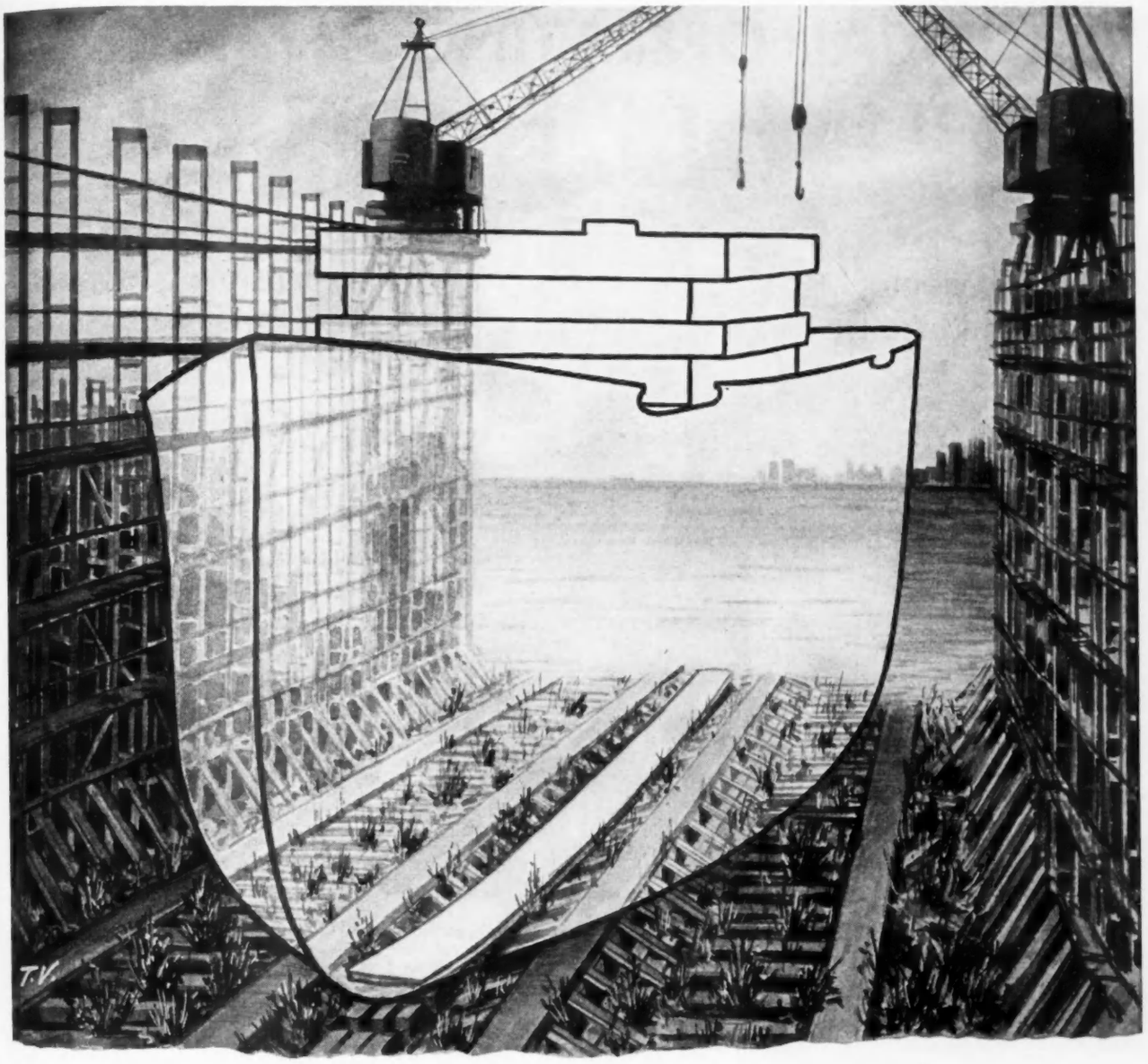
"California oil producers are looking forward to a gigantic market for their crude after the war, with attendant high prices. Oklahoma and Texas marketers would like to have that outlet. There are a considerable number of California companies which have heavy production in Oklahoma and Texas.

"If the proposed pipe line should break down the price of California oil or prevent it from going up, these companies still would enjoy whatever prosperity might prevail, because of their ability to market Oklahoma and Texas crude through California ports. If the pipe line worked to the disadvantage of anyone in this state it would undoubtedly be the independent operator."

The line of attack upon the idea now most favored by the California group is centered upon the plan's most vulnerable feature—its great cost both in terms of money and of steel. This cost, in each instance, of course, would be governed by the magnitude of the line's diameter and of the facilities necessary for its operation. As a working figure, however, the sum of $40,000,000 is generally accepted as an approximate.

California operators point to this staggering figure and to the obvious enormity of the steel pile that would be required, arguing that either one would make the proposal a most dubious scheme and that the two together should mark it as unreasonable and prohibitive. A fraction of the cash total, and steel tonnage far under minimum estimates for any pipe line, if allotted to drilling in California, they contend would accomplish the same objective.

So far as a very broad inquiry was able to determine, the proposal really has never got beyond the stage of tentative consideration. Possibly, with realization of the great difficulties that would have to be surmounted to win government approval for the plan and of the assurance of arousing a violent and clamorous protest from the California operators, the proposal will be permitted to languish. For the sake of continued amity and friendly relations between Mid-Continent and West Coast operators, regardless of other considerations, such an outcome might be thought the best.

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# PRACTICAL OPERATING *Hints* FOR THE PIPELINER

*$5.00 will be paid for each illustrated acceptable contribution. Mail to The Editor,* THE OIL WEEKLY, *Houston.*

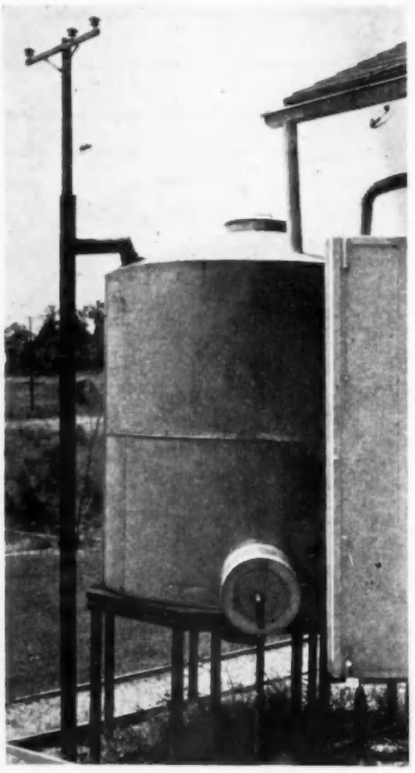
### 1. WATER SUPPLY

## Rainfall Collector Maintains Make-Up

WHERE rainfall is sufficient for the station roof runoff to provide make-up water for the cooling system, an elevated tank permits the necessary periodic leanings more readily.

One station is equipped with a galvanized tank, directly under a corner of the station roof, and serving to trap all the water draining from the structure. A combined vent and overflow unit of 2-inch pipe is set on one side of the sloping top, with the overflow at a level slightly below the removable cover in the tank center. The vent pipe, extending above the structure, is screened to prevent possible entry of insects.

The outlet line, placed some six inches above the tank bottom to permit settling of any debris washed into the tank, is brought out through a lagged cylindrical section, to permit conservation of existing tank heat as far as the emergency cut-off valve, and thus guard against freezing of the small line. The tank contents retain sufficient heat to maintain a temperature above freezing during any cold spells which may be expected in the latitude where the unit is employed.



**Collector troughs deliver roof drainage to insulated tank and avoid surface water troubles.**

### 2. PIPELINE PLUGS

## Expansible Stoppers For Temporary Seal

WHEN welding new connections or extensions to a cut line which has carried oil or gas, it frequently is necessary to blank off the open section of pipe to eliminate fire hazard and permit welding to be carried out in a bell hole or other enclosed place.

One pipe line company developed a plug for such line sealing, which is much more effective than the usual dike of rammed clay, and which will withstand high pressures without shifting. The plug consists of two heads of heavy steel plate, cut to fit easily within the diameter of the pipe to be plugged. A 1¼-inch hole is drilled or burned through the inner plate, and a 1- or 1⅛-inch nut welded across the opening thus formed. A similar hole is cut through the outer plate, through which is run an eyebolt of the same size as the nut welded to the backing plate. This eyebolt carries a shoulder to bear squarely against the outer plate, and may be fixed thereto by a cotter or othen pin through appropriate hole just inside the steel disk.

Between the two steel heads are arranged a number of synthetic rubber disks of the size used to drive scrapers through the size of line for which the plug is designed.

By slipping the unit into the open end of the line, and turning the eyebolt to screw it into the back plate, pressure is applied to the rubber washers, and they are expanded to fill the pipe and seal it

**Threaded through eyebolt permits squeeze to be applied to rubber scraper-driving disks and the unit thus to be expanded against pipe wall to provide temporary welding closure.**

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effectively, at the same time gripping pipe walls sufficiently well to resist pressure.

The unit is removed simply by slacking off on the eyebolt or, if necessary, dismantling the unit and extracting it piecemeal.

### 3. *LINE TRIPOD*

## Collapsible Unit Aids Line Handling

COMBINING otherwise junk material into an effective hoist for spotting heavier pipe lines in the trench, one company incorporated a number of improvements over the usual tripod used for such work.

Two legs of the frame are tied into a stiff A-frame, with the side members spaced apart at the top slightly more than the diameter of the pipe used. On this frame is mounted a geared hoist, on which may be wound chain or small wire line which, through a sheave at the top, provides means for lifting pipe. The pinion spindle of the hoist is extended through the frame, and carries on each end a large valve wheel, keyed and locked in place. These wheels serve as support when the unit is rolled along the pipe trench, and, when set up, provide means whereby the pinion shaft may be turned to operate the hoist.

The third leg of the unit is made with short horizontal extension to fit between the tops of the A-frame members where it is pinned, and to carry the sheave for the line. A detachable brace is affixed to the leg when open, and prevents closing of the unit under load. Hand bars welded at top and near the base of the third leg provide for raising this side of the unit for shifts where it is not considered desirable to fold the frame and trundle it on the pair of wheels.

### 4. *FIRE PROTECTION*

## Special Housing Saves Stored Hose

TO PROTECT the canvas fire hose against weather, yet permit it to be stored immediately adjacent to the hydrant, one company erects small vertical bins, of light tank steel, at points of use. The bins are made just wide enough to admit a roll of hose edgewise, and large enough to take the maximum length of hose which would be stored at one hydrant.

Narrow bin holds rolled fire hose without impeding quick handling in case of emergency.

To use, the hose is pulled from the bin by the coupling end, unreeled on the ground, and the female coupling made onto the hydrant before stretching the hose to the point of use. When stored in this manner, after being thoroughly drained, the hose is free from moisture, protected against sunlight and abrasion, yet readily available.

Normally the coiled hose is rolled back on itself to the rear of the bin.

Folding third leg and converted valve wheels simplify transportation of this trench pipe-handling unit and wheels serve dual purpose as means for applying power to winch.

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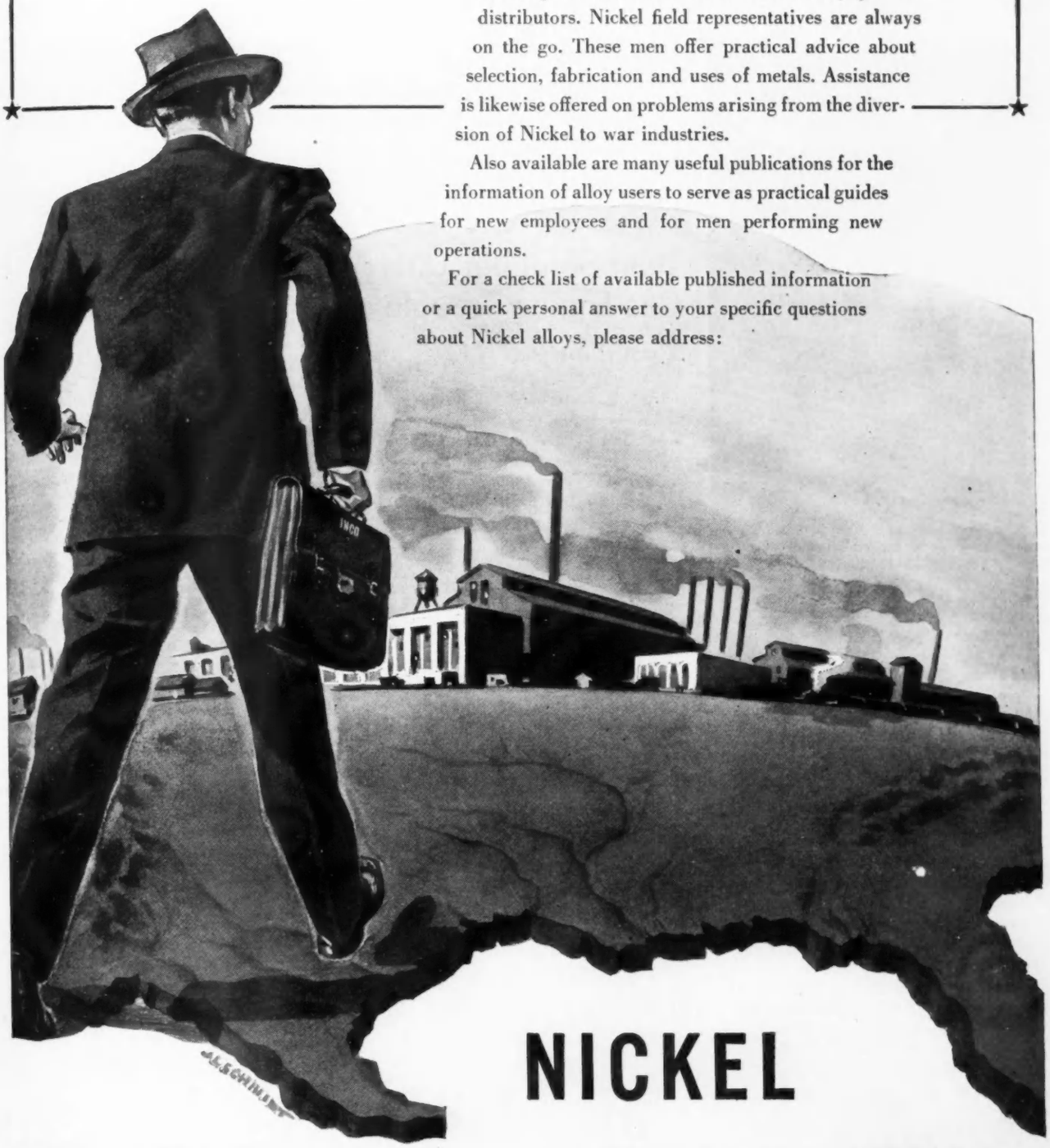


## NICKEL

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# PRACTICAL OPERATING *Hints* FOR THE PRODUCTION MAN

*$5.00 will be paid for each illustrated acceptable contribution. Mail to The Editor,* THE OIL WEEKLY, *Houston.*

### 1. BLEED-OFF DEVICE

## Reversed Regulator Clears Trapped Gas

**Casing annulus cleared of back-pressure automatically to allow accumulation of next fluid head.**

A BLEED-OFF arrangement for gas pressure has been made through novel use of a small regulator. The well, operated by intermittent injection of gas into the casing-tubing annulus, does not have a packer but utilizes the fluid level to prevent the gas from coming around the open ended tubing string. At the proper time, the surface control unit on the one-inch line allows gas to enter the casing and build up sufficient pressure to eject fluid through the tubing. After an injection period, the control shuts off the gas and the pressure in the casing decreases as long as the well unloads. This procedure stops at a certain point and pressure is trapped in the casing-tubing annulus. In order to vent this pressure so that the fluid level may build up higher in the well, the small regulator was installed — reversed — between the well head and the surface control unit.

Because the low pressure side of the regulator is next to the gas flow, the regulator shuts off as soon as the high pressure gas begins its injection period. After this period, and as soon as the gas pressure is reduced by the action of the well, the regulator again opens and allows the pressure in the casing to be bled down a predetermined amount—in this case, to 100 p.s.i.

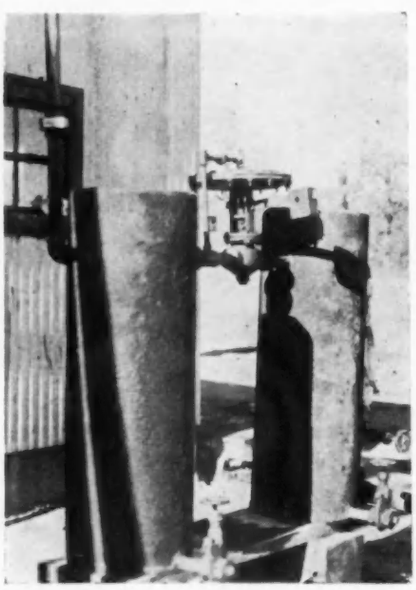
It is necessary to take proper measures to assure normal operation for the high pressure gas works on the low pressure side of the regulator. If the pressure differentials are not too great the arrangement is satisfactory. As a safety measure, four small holes have been drilled in the housing in case the diaphragm should fail.

### 2. FUEL SUPPLY

## Dual Scrubber Cuts Gas Engine Trouble

PROVIDING clean fuel for a pumping engine can be done with a double scrubber, made of short joints of adequate sized pipe mounted on a common base and connected with piping in which the pressure regulator is installed. The first, or upstream section receives the gas as it comes from the fuel system where most of the foreign matter is trapped.

If moisture or solid matter should flow with the gas through the regulator, the low pressure section then prevents contamination from passing through the lead line to the fuel mixer.



**Tandem mounting provides better regulation and effectively traps liquid slugs in wet gas stream.**

### 3. UNITIZATION

## Compartmented Tank Provides Many Fluids

**Distribution cocks at side of maintenance truck permit selective withdrawal of desired liquid.**

ILLUSTRATING the trend toward complete utilization of equipment, and enabling various materials to be distributed sparingly and effectively, one company designed a compartmented tank which was built into the truck just behind the cab.

The tank, with as many compartments as fluids to be handled, is welded from any sheet metals available. The filler spouts are 2-inch female-thread protectors, welded to the tank above the different compartments. Male protectors serve as caps for the spouts.

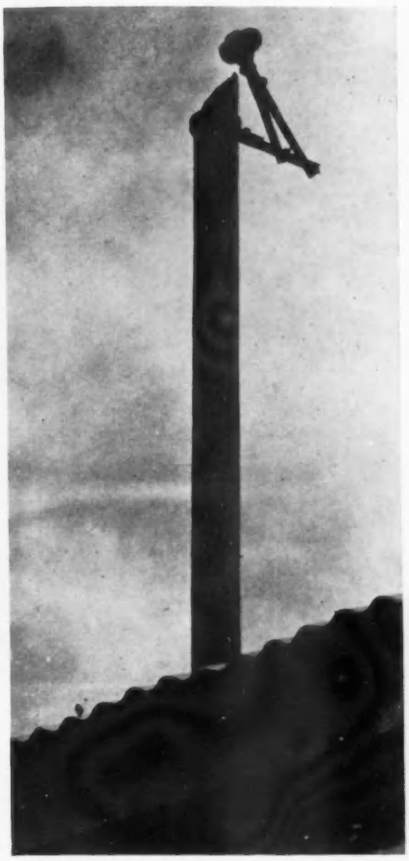
Convenient pipe lines are attached to the bottom of each compartment, secured by welding reinforcing flanges to the metal so that vibration and constant use will not break the connections. These pipe lines are led from the base of the compartments through the side of the pick-up body ending just in front of the rear fenders where they are guarded by the running board.

Oils and light products, such as solvents, have lines equipped with con-

ventional gate valves which are adequate for the prevention of seep leaks of the commodities. On the opposite side of the truck are the treating-chemicals stop cocks, which are the type used for heavy liquids, and operate with a sliding movement, up to open and down to close.

### 4. SIGNALS

## Adjustable Barker Warns of Unit Halt



**Bullplug mounted on dual arms may be set to intercept exhaust impulse and far-reaching signals produced.**

ENGINES with variable loads, or those where fuel injection quality or pressure may change, are often addicted to the habit of going dead—especially in the night or early morning period, usually when no one is about. When this happens, especially to a compressor station, wells using the gas for lifting purposes may clog up and the complete operation of the lease may be disrupted.

In a station with two separate drive compressors, one is direct-connected to the generator for the lease electrical system; when the power is off, this engine is known to be down. The other engine, however, gives no indication when it stops. The easiest solution in this case is to increase the engine noise so that the lease man can "hear," or rather, fail to hear when it stops. Accordingly, an ordinary bull-plug is attached to the engine exhaust as shown. Similar to the old-time whistle made by a child blowing at an angle into a tube, this bull-plug arrangement, which can be placed at the necessary angle by means of the adjustable arm, creates a constant barking noise which the lease man unconsciously accepts; he realizes something is amiss when he fails to hear the "bark."

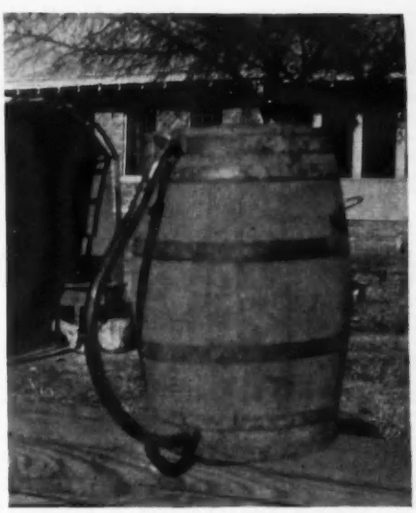
### 5. WATER SUPPLY

## Bubbler Serves in Paper Cup Shortage

PAPER drinking cups, regularly furnished in connection with the usual water cooler or barrel for the use of the men in the gang, are increasingly hard to get, and their lack may soon force a return to the unsanitary and unsatisfactory common drinking cup.

One company gets around the drinking cup shortage by attaching a short length of half-inch hose in place of the usual faucet on the water barrel, installing a regular bubbler or drinking fountain at the other end of the hose. When not in use, the fixture is hooked over the rim of the barrel or on a special fastener at the top of the water container.

To use, it is necessary only to lower the fitting, when gravity flow through



**Simply lowering the hose provides flow through drinking outlet, while replacing on hook cuts off stream.**

the hose gives a stream which clears the fixture and allows drinking without contacting the metal. There is little water waste, as the workman can regulate the stream simply by shifting the height of the fixture, and will shut off the flow merely by replacing the unit on its hanger.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# ☆ ☆ ☆ ☆ WASHINGTON ROUNDUP ☆ ☆ ☆ ☆

CRUDE-OIL prices were the major subject of oil discussions in Washington last week, with two congressional committees investigating the decline in wildcatting.

Before one committee it was revealed that PAW had recommended an increase in crude prices averaging 35 cents per barrel, but there were indications that OPA had reacted unfavorably, although there was some ground to believe that it might change position as a result of steadily increasing pressure from both the industry and Congress.

Both committees were told that OPA ceilings were responsible for currently low exploratory activities and that prospecting could be accelerated only by an increase of not less than 50 cents a barrel, while Price Administrator Prentiss M. Brown and Petroleum Administrator Harold L. Ickes explained to one committee why no action has been taken on prices after more than a year's study of petitions for relief.

OPA would "have the duty to raise prices," declared Brown, if it found that this "would aid in the effective prosecution of the war." However, he added, "The very strongest showing will have to be made that it is necessary to increase the price in order to increase production and its ultimate transportation and delivery to the fighting fronts."

Sumner T. Pike, head of OPA's fuel section, told of the complaint of the producers that the price was too low, commented that "I have never seen the time yet when the producers did not think there ought to be an increase in the price of oil. The current price," he said, "is a sufficient incentive for people to explore." Told that testimony had indicated that the major companies were less interested in an increase than the independent producers, he expressed the belief that was not so; Ickes later told the committee he thought it logical that the big companies should be less distressed than the small operator with no other resources.

"My opinion is that the price of oil is a fairly good price," declared Pike.

Pike's evasion of questions regarding Ickes' recommendation brought sharp interrogation from Representative Walter C. Ploeser of Missouri, and Pike finally admitted he had written a memorandum on Ickes' recommendation for Brown's guidance. In sharp contrast with Brown and Pike's side-stepping was Ickes' forthright response to committee questions.

Only slightly less important were developments in the Eastern supply situation, where a further reduction in stocks in the face of a new high record tank-car movement indicated heavy offshore withdrawals. Army and Navy estimates of 1943 requirements finally secured by PAW apparently will be impressive, for he warned seriously that it did not now appear likely that any relaxation of rationing restrictions could be granted in the near future.

Tank-car deliveries during the week ended April 10 averaged 924,079 barrels daily, an increase of 11,160 barrels over the preceding week, and box-car deliveries of kerosine in drums averaged 24,667 barrels, an increase of 3620, making a total rail movement of 948,746 barrels as compared with 933,966 barrels during the week ended April 3.

Despite the increase in supply, however, the index of East Coast stocks fell from 30.2 to 28.8 during the week, or approximately 500,000 barrels, and storage stocks currently are 14,500,000 barrels below a year ago.

Considerable interest was created in oil circles by a letter from Secretary of Commerce Jesse Jones to Senator O'Mahoney of Wyoming, outlining RFC policy with respect to oil loans, but it was generally agreed that it fell far short of what really is needed to take care of the situation.

Federal control of any new important oil fields discovered in states without conservation statutes was threatened by Ickes, in a letter to Indiana officials deploring the failure of the state legislature to pass a conservation law at its recent session.

Nearing completion at the end of the week were a reorganization and expansion of the PAW reserves division; an order giving a degree of autonomy to the California PAW district office (THE OIL WEEKLY, March 29); a P-98-b order covering materials for development and supplementing the P-98-b issued April 1 to cover material for maintenance, repair and operations (THE OIL WEEKLY, April 5), and PAW's material distribution program No. 2.

**Ickes Recommends 35 Cent Raise In Crude Prices to OPA**

»

**Congress Told Low Prices Cause Less Exploration and Major Company Control**

»

**East Coast Stocks Drop Despite Record Deliveries**

»

**Ickes Threatens Federal Control For Non-Conservation States**

»

By B. F. LINZ
Washington Correspondent

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# Oil Men Explain to Two Congressional Committees Why Higher Prices Needed

Representatives of independent oil producers staged a "double-header" in Congress last week, appearing first before the oil group of the House interstate and foreign commerce committee and then before the Patman small business committee, discussing the causes of the decline in new discoveries and emphasizing the need for a price increase to stimulate wildcatting.

Oil men began to parade before Chairman Clarence F. Lea of California and his oil subcommittee April 13, many of them going on to tell Congressman Wright Patman of Texas and his group the same story the following day.

Stripped of hours of discussion and questioning, the stark facts of the situation are that productive capacity has been reduced by more than 200,000 barrels a day, more than 58,000,000 barrels have been withdrawn from above-ground storage, discovery activities are at a low ebb, restrictions on material are affecting development, the manpower situation is becoming more critical, the industry is disturbed by the treasury's efforts to eliminate the depletion allowance, and present prices contribute nothing in the way of a stimulus to improve conditions.

Brown blamed Administrator Harold L. Ickes for failure to act on the price question, asserting the matter has been before him for more than a year but that he took no action until recently, when he told PIWC he had sent a recommendation to OPA but did not disclose what it was, only a few hours before President Roosevelt issued his "hold the line" order to halt increasing living costs.

However, Brown admitted, PAW and PIWC have "many definite accomplishments" to their credit although, he added, "in respect to the principal responsibility of becoming a stronger industry to insure sufficient supplies of petroleum for war and essential civilian requirements, the petroleum-producing industry has become continuously weaker instead of stronger."

### Insists on Higher Prices

Like those who followed, the IPA counsel was insistent upon the necessity for an improved price and decried suggestions for a subsidy for new discoveries, expressing the belief that it would attract inexperienced men who would drill for government money instead of oil and criticising such proposals as making "suppliants" of operators.

"We feel that price is the primary

stimulant to the accomplishment of real production and discovery," he declared.

Questioned by members of the subcommittee, Brown rated the treasury's efforts to eliminate the depletion allowance as the "No. 1 discouragement to exploration," and called attention to the fact that the Office of War Information, supposedly a news-distributing agency, had come to the support of the treasury, devoting about a page in its recently-issued pamphlet, "Battle Stations for All," to reviewing the treasury's arguments.

Responding to a question as to the effect of the President's order for a 48-hour week, Brown estimated that it had increased costs in some activities by 25 to 30 percent, and charged the administration has failed adequately to deal with the manpower problem. Here, too, he said, price enters in, since an adequate price would have enabled the operators to hold men who have gone into other war industries which could offer higher wages.

### Not Fair With Oil

Appearing out of turn to enable him to keep an out-of-town engagement, Boyd told the subcommittee PIWC made a recommendation for an increase in price last October and repeated it in February, declaring that "if the government regards oil as ammunition, it should provide the necessary financing for every part of its oil operations."

The oil producers, he said, are the only group engaged in the war effort which the government does not insure a margin above cost; every contract that is made, including those for high-octane gasoline and butadiene, provides such a margin. Further, he pointed out, the government has set up an agency to tell the industry what to do without providing compensation for carrying out its orders.

"Price is the proper incentive to make the drill operate and find new oil. A proper price also should be paid to stimulate secondary-recovery operations, and something ought to be done to prevent abandonment of stripper wells."

Recent analysis of conditions has developed that production this year will not reach the average of 4,400,000 barrels daily which the cost and price adjustment committee anticipated in its report to PIWC in February, and is likely not to exceed 4,150,000 barrels, it was disclosed by H. B. Fell.

In neither the Southwest nor California, the only two areas in which the committee found output could be increased, can production be raised to the extent estimated less than three months ago, he said.

"If we were certain all the oil needed could be produced, there would be no purpose in this investigation," he said, "but we are quite certain that under existing conditions it cannot be accomplished.

"The producing branch has shown a decline in every phase of its activities since we entered the war—above-ground stocks have been reduced, average daily production has declined, completed wells and producing wells have declined substantially, and there has been a decline in discovery of new reserves.

"The industry will not be able to produce as much this year as anticipated."

Fell sharply attacked the Tariff Commission's cost report, declaring that it covered only about 15 percent of the producers, 50 percent of the wells and 70 percent of the production; in other words, was a historical assay of the operations of the wells which produce most heavily and consequently at the lowest cost, and did not even take into consideration the cost of finding oil.

He told the subcommittee that his group had interpreted and projected the report, and came to conclusions quite different from those reached by the commission and, subsequently, by OPA which held that the report evidenced no need of the industry for a general price increase.

Fell declared that to remedy the situation it will be necessary to maintain and increase production, keep existing wells in operation, instigate additional secondary-recovery operations, procure additional development in known proven fields and discover and develop new fields.

"All of these things tend to put the greatest number of productive wells in operation," he said.

At the April 14 hearing, drilling contractors and independent producers lined up behind the proposal for a 50-cent increase, and the subcommittee also heard Col. Ernest O. Thompson of the Texas Railroad Commission, who earlier in the day testified before the Patman committee.

The case for the drilling contractors was presented by Harold F. Thompson of Dallas, counsel for the American Association of Oil Well Drilling Contractors, who, reporting that his information indicated that drilling expenses had increased 20 to 40 percent, declared "the contractor cannot absorb the increased cost and survive."

### Contractors' Costs

Detailing how costs have increased since 1940, Thompson said rig-building expense is up 15 percent; labor, including insurance, 20 percent; materials, 15 percent; transportation, 15 to 25 percent, and miscellaneous expenses, 20 percent.

Further, he said, many supply items are difficult to obtain or inferior in quality, particularly the "victory" steel bit, which he said is "not so good."

While the contractors are not in bad shape so far as capital items of material are concerned, they have a real problem with respect to items generally classed as maintenance, repair and operation, Thompson explained. Drillers as a rule do not carry substantial inventories of such materials, and now can not secure sufficient quantities.

On questioning by Representative Brown, he said drillers can carry on on the restricted basis of present operations, but it would be very difficult to expand drilling by as much as 5 percent.

Even if sufficient material was available, he added, manpower would be a problem, and the War Manpower Commission has been asked for assistance. Specifically, he said, the contractors are seeking to have a critical-occupation status given to workmen on derrick floors in rotary drilling.

Within the past few weeks, Thompson said, the contractors have been increasing their charges after having operated as long as possible on the pre-war basis. "The average contractor has either been operating at cost or in the red for the past year or two," he declared; "that condition can not continue."

New oil fields will be found, but their finding will be more difficult, it was asserted by J. C. Hunter of Abilene, Texas, president of the Mid-Continent Oil and Gas Association, who also represented Governor Schoeppel of Kansas, chairman of the Interstate Compact Commission, who was unable to come to Washington.

### Ability to Increase Output Limited

"We do not have the ability to produce, with or without waste, any great quantity of oil beyond what we are now producing," he said, "and the greatest danger we have is that we may be driven into a method of production that will not only waste a great deal of oil for ultimate recovery but to a substantial extent destroy our ability to produce now."

Such waste, he warned, would follow any opening of the valves of the flush wells, quickly driving them on the pump at a time when equipment is difficult to procure. There would be a delay in getting artificial lift under way and that delay, he said, might lose the war.

Hunter told the subcommittee that while the question of price is paramount, there are other phases of the situation with which Congress might deal, particularly in the field of taxation.

He explained that the original depletion allowance was figured on a discovery value basis but later was limited to 50 percent of the net income from the property and finally was amended by incorporation of the provision for 27½ percent of the gross income from the property.

In normal times, the law worked out all right, he said, but under present conditions the owner of stripper wells, secondary-recovery wells or other high-cost production suffers from the restriction of the allowance to 27½ percent of the gross but not exceeding 50 percent of the net income. The result, he pointed out, is that a well owner must have a net income of at least 55 percent of his gross in order to get the full allowance. High-cost wells, he said, do not pay out on anything like that ratio.

### Major's Gaining Control

Independent operators' properties are rapidly going to the major companies and many of the most enterprising wildcatters have gone out of busienss, it was testified by J. P. Coleman, Wichita Falls, appearing on behalf of the North Texas Oil and Gas Association.

Coleman emphasized that it will not be possible to get the new production necessary so long as one government agency (PAW) calls on the industry for increased drilling and output and another agency (OPA) demands price reductions.

"The major integrated companies may subsidize their production departments with profits from other departments, but the independent oil producer, like the farmer, sells only his raw product," he said. "When the producer of raw material is depressed, the entire system may fail."

Final witness before the committee was Col. Ernest O. Thompson, who described the situation as seen by the Texas Railroad Commission and, to

support the contention that the independent operators have discovered the bulk of the new fields, submitted a tabulation of all independent discoveries from that of the first Texas field through 1942.

"The independent is no longer finding it possible, under the present price of oil, to go out and make discoveries," Thompson said. "The incentive is just not there, and it is further evidence that the big companies are fast buying out the independent operators.

"In my mind it is a sad condition which should be remedied. The government is holding the price down and the result seems to be that the big oil companies are buying the independents out at this depressed price, which is less than the cost of reproduction."

Thompson reviewed the discovery trend of the past few years, explaining that the lack of new reserves due to currently restricted exploration will be felt in 1945 or 1946 when reserves now found would be coming into full development, and pointing out that low prices in any particular year are reflected in the rate of discovery two or three years later.

"If it be true that we are going to need more oil in the future—and none can deny this need from the military standpoint — then it certainly behooves the administration, through OPA, to permit the price of crude oil to increase so as to bring this basic commodity up to the level of other basic commodities," he said.

"If this continues, with the government holding the price of oil down to a point where every barrel sold is being sold at a price less than the cost of replacement, it will not be very long until there will be very few independent operators left in the field.

"This certainly should be sound argument for a prompt increase in the price of crude. If we are to save the independent operator and keep him wildcatting and hunting for new fields, a price raise must be had in the near future."

### *PAW to Reorganize Reserve Division*

Reorganization of the petroleum reserves division of PAW, under the direction of W. B. Heroy, planned largely with a view to assuming a larger role in the job of expanding exploration, is being worked out and will probably become effective before the end of the month.

While PAW officials would not discuss the change in advance of its perfecting, it is understood that the division will be divided into three branches, probably dealing with conservation, exploration and reserves, respectively, to be headed by Carlton Speed, F. V. L. Patten and Basil Zavoico.

Patten and Zavoico are already connected with the division, the former as assistant director, and Speed has been serving as an assistant to Deputy Administrator Davies.

PAW officials for some time have been considering expansion of the reserves division in view of the added responsibilities imposed upon it by Administrator Ickes' plans for stepping up wildcatting.

# OPA and PAW Quarrel Over Price Situation Before Patman Group

Buck-passing and evasion by OPA officials delayed the Patman small business committee exactly one hour in getting the anwser to the question whether Administrator Ickes had submitted a recommendation for a crude oil price increase, but finally brought out that the had recommended an increase averaging 35 cents per barrel.

Appearing before the committee April 16, Price Administrator Prentiss M. Brown, asked about the recommendation, which Ickes the previous day had refused either to affirm or deny, said that in view of that non-committal attitude he would prefer that the oil chief make the answer.

#### OPA Evasive

Later Sumner Pike, director of the fuel price division of OPA, gave the same answer and sought to evade questions regarding his own recommendation to Brown, finally admitting that he had made "some comments."

When Ickes appeared, he too was asked about the letter, and replied "It's Mr. Brown's letter." Informed of the position taken by Brown, who had left, Ickes expressed his disgust with buck-passing but insisted it was up to OPA and Pike, thus cornered, finally admitted it had been received.

Brown apparently sought to give the impression no recommendation was before him, for he told the committee "The matter will come to our office in the form of a recommendation from the petroleum administrator. Upon receipt of his communication it is out duty to determine whether or not the price of oil should go up or down."

He told the committee that President Roosevelt's "hold the line" order "greatly affects" the oil situation, then added that he interpreted the stabilization act and the order as requiring him to adjust prices where necessary to the war effort.

Asked for a statement of his position on price, Ickes pointed out he had urged its consideration two years ago.

"I took the position I did not know whether the price should be increased or not, or if there should be an increase it should be a general increase, but I thought the thing ought to be carefully reviewed and if it was determined, as a matter of fact, that the price was too low the price should be increased," he said.

Asked about his most recent recommendation and the OPA officials' hedging, he commented "It looks like passing the buck" and told the committee: "I have tried to summarize the facts in a letter to Mr. Brown and I have expressed my views. I do not care to be put into a position of making this a public controversy, but if I had received a letter on this subject and it had related to something within my jurisdiction, I do not think I would have hesitated to say what had been suggested to me."

At this point Pike admitted that the letter had been received April 7, the day it was written, and had recommended an increase averaging 35 cents a barrel. The basic arguments for the increase, he said, were that it would keep in production stripper wells that now face abandonment, encourage resort to secondary recovery methods, make profitable the drilling of edge or marginal locations and encourage wildcatting.

Asked by Ploeser what recommendation he had made to Brown, Pike explained that he had merely drafted some "preliminary comment" that it was a "pretty bad time" to increase the price of oil when increases on coal and farm products were being agitated.

Ickes agreed that the major companies were increasing their domination of the industry as a result of present conditions. He said that 20 companies had 60 percent of the oil two years ago and 70 percent now, differing only in degree with the testimony of Colonel Ernest O. Thompson and others that 17 companies had increased their share from 48 to 71 percent.

Asked when the increase should be granted, the administrator said "right away" and asked by Representative Leonard W. Hall of New York whether he agreed that if price increases are not granted the big companies will continue to grow, said "I think that is inevitable—and it is unfortunate."

#### Ickes Comments

Before he left, Ickes had a few comments which he said he wanted to make. He pointed out that up to last December 2 he had no authority to issue an order but had to go "hat in hand" to some other agency and ask for it.

"I brought one order and it was amended over our protest," he said. "I tried to have the amendments stricken out and pointed out then it would mean the death of a lot of small companies and the objection was raised 'well, we have no concern about that; they are war casualties.'

"So far as prices of crude are concerned, when we ran into the period when it was seen it would be necessary to establish ceilings, prices of crude should have been on a parity with the prices of other products. The industry could never get a hearing and when we asked that the industry be given a hearing on the question of price I was turned down.

"Now it is said 'This is a poor time to raise oil prices.' It has been a poor time for two years. A recommendation for a 25-cent increase went over to OPA two months ago from the industry, when there was no question of coal prices."

Asked how long it would take OPA to act on the recommendation, Pike said he hoped it would be less than the two months the PIWC request was pending on Ickes' desk, but indicated OPA would have to make an investigation of its own into "factors" which PAW might not have considered, and was told by Ploeser that in view of Ickes' knowledge and responsibility, his recommendation should carry great

weight and "it should be your intention to cooperate with what they feel to be necessary more so than to oppose it," coupled with a warning that Pike would be held responsible should a crisis result "because of procrastination and reluctance to grant an increase."

Chairman Patman, expressing the hope it would not take so long, told Pike that "the great complaint against OPA is delay and delay. It would be better to make more mistakes than to do nothing."

First witness before the Patman committee was Russell B. Brown, whose testimony was preceded by a statement by the Texas congressman that he had been "swamped" with complaints from all branches of the industry, but particularly the producers.

"Complaints have been numerous of the handicaps under which all independent operators are functioning, many of them unable to function at all due to conditions over which they have no control," Patman declared.

"Among the complaints that have been registered with me, and doubtless with other members of the committee, is that the price is so low that they are unable to operate successfully with the higher cost of operations. As a consequence, many of these small oil-producing companies are forced to sell out to larger companies who, it is claimed, are not doing any promotion of new wells since they have vast reserves of proven fields under their control."

As before the Lea committee, Brown merely laid the groundwork for the testimony of succeeding witnesses, repeating his review of the situation now existing.

### A Real Shortage

A "real shortage" of oil as early as 1945 unless prices are raised, was predicted by Colonel Ernest O. Thompson of the Texas Railroad Commission, who was scheduled to repeat his story later in the day before the Lea subcommittee.

The only way to head that situation off, he said, is to increase the crude price sufficiently to stimulate new discoveries which can be developed within two years. There is no chance to increase the present rate of production without endangering the bottom-hole pressures necessary to keep wells in condition and insure maximum ultimate recovery, he warned.

Thompson explained that for some five years available supplies exceeded market demand, with the result that prices were low and there was little incentive to explore. The industry was in this position when prices were frozen by OPA, whose action came at a time when demand was overtaking supply and in the normal course of events there would have been an increase in wildcatting.

Meanwhile, he said, production costs have increased materially, and independent producers have been caught between increased costs and fixed prices with no way out but to sell their properties to the major companies.

Thompson estimated that Texas properties valued at $75,000,000 have been disposed of in this way in the past six or eight months. At present prices it would take 20 years for those properties to pay out, he said; small producers cannot afford to operate on that basis, and if the situation continues a few large companies eventually will hold all the oil properties.

Railroad commission studies, he reported, showed that 77 percent of the oil discovered in Texas was brought in by independents in 1941 while in the following year they accounted for only 48 percent. Since it takes 80 dry holes to discover one important field, on the average, the situation in which the independent finds himself is obvious.

While witnesses before the Lea subcommittee had contented themselves with asking for a 50-cent increase in crude prices—although with the suggestion that if that amount did not prove effective it should be raised—Thompson told the Patman committee that to bring oil on a parity with other commodities would require an increase of 58 cents; he, too, said if this was not sufficient to develop the more intensive exploration necessary, it should be raised.

The commissioner was frank in his statement that a 58-cent increase in crude would require a raise of about 2 cents a gallon on gasoline and that the increase should be passed on to the consumer. Most witnesses had suggested the possibility that the industry in its other branches might absorb all or part of the higher gasoline price which would result from the higher crude price.

At its April 15 hearing, Patman found himself confronted by a large number of witnesses and only about two hours time, the committee being unable to sit during the afternoon and anxious to get to their real victims—Brown and Ickes—the following day.

Accordingly only a few were heard and the rest were asked to file written statements.

Among those heard, however, was H. B. Fell, executive vice president of IPAA and representative also of the National Stripper Well Association, who submitted a copy of the report of the committee on cost and price adjustment of PIWC as a basis for his discussion.

One of the factors of the situation which does not appear to have been taken into account by the war agencies in dealing with the problem of oil prices is that of time, Fell indicated, explaining that it takes one to two years for a raise in prices to be reflected in an increase in producing wells.

This would be an "alarming and disturbing" situation even in normal times, but is extremely critical in the midst of a war, Patman commented.

Both Fell and A. K. Swann of Evansville, Indiana, attorney for the Tri-State Petroleum Association, who followed him, stressed the deficiencies of the Tariff Commission report on which OPA has based its refusal to grant a general increase. Both witnesses pointed out that the report was only historical, covered only a part of the industry, and dealt only with wells drilled under normal conditions which no longer exist.

Their review of the report drew from Patman a comment which appeared to represent the view of the committee as a whole—that regardless of the Tariff Commission's findings or theories of OPA, the fact was that production and exploration in declining and abandonments are increasing.

Swann charged that one result of the situation has been to develop a definite trend toward monopoly because the smaller operators are losing money or see no hope of profit and are going out of business. He agreed that the major companies may not be taking advantage of the situation to develop a monopoly and, in fact, may themselves be concerned over the trend, but economic forces are gradually concentrating more and more of the business in their hands.

Several of the witnesses criticised PAW for its "big company" domination, Swann declaring that it is 99 percent dominated by the major companies. However, he said, within the policies under which it operates, PAW is an efficient organization.

Joining in the plea for an increase in price, T. A. Morgan, director of conservation of the Kansas State Corporation Commission, submitted figures and a projection on recent developments in his state to show that the present price does not make a return on money invested in wildcatting.

During the first quarter of this year, Morgan said, 352 wells were drilled in Kansas of which 94 were wildcats. The cost of drilling was put at $30,000 a well, or $1,535,000 for the 94 wildcats, only 15 of which turned out to be producers. Assuming that each of the wells would drain its 40 acres and assuming further a total recovery of 4000 barrels per acre, the discovery cost of the oil was 63.9 cents per barrel; with a lifting cost of 30 cents and an allowance of 35 cents for royalties, delay rentals and bonuses, the total cost, before taxes and salaries, amounts to $1.29 per barrel. The current price for the oil is $1.17, he said.

## SUPPLEMENTARY ORDER NO. 6
## To Petroleum Administrative Order No. 11
## General Exception Pursuant to Paragraph (c)(10) of Petroleum Administrative Order No. 11

Section 1515.12 Supplementary Order No. 6 to Petroleum Administrative Order No. 11.

(a) **Definitions.**
The definitions of Petroleum Administrative Order No. 11, as amended from time to time shall apply in this Order.

(b) **Secondary Recovery Operations.**
Pursuant to paragraph (c)(10) of Petroleum Administrative Order No. 11, any person may accept delivery of, acquire, or use material for secondary recovery operations by means of artificial water drive, gas drive, or air drive on any lease or property on which secondary recovery operations were actually being conducted on March 30, 1943.

(c) **Violations.**
Any person who wilfully violates any provision of this Order, or who, by any act or omission, falsifies records kept or information furnished in connection with this Order is guilty of a crime and upon conviction may be punished by fine or imprisonment.

Any person who wilfully violates any provision of this Order may be prohibited from delivering or receiving any material under priority control, or such other action may be taken as is deemed appropriate.

(d) This Order shall take effect on the date of issuance and shall continue in effect until June 30, 1943.

(E.O. 9276, 7 F.R. 10091; E.O. 9125, 7 F.R. 2719; sec. 2(a), Pub. Law 671, 76th Cong., as amended by Pub. Laws 89 and 507, 77th Cong.)

Issued this 10th day of April, 1943.

(Sgd) R. K. DAVIES,
*Deputy Petroleum Administrator for War.*

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WISSCO PRODUCTS

# Ickes Says Government Will Stop Wasteful Production

Failure of the Indiana general assembly to enact oil-conservation legislation was lamented by Administrator Harold L. Ickes April 14 in a letter to Hugh A. Barnhart, director of the state department of conservation, in which, however, he served notice that if new important deposits are discovered in Indiana during the war they will be developed in an orderly manner regardless of any action taken or omitted by the state.

"That the legislators of your state should have succumbed to the same strategy and the same misguiding leadership which defeated efforts to get a decent conservation law in your neighboring and my home state of Illinois is not easy to understand," Ickes wrote. "Indiana had before it the example of Illinois where, by gold-rush tactics characteristics of the worst open-flow days of the oil industry, production went from a little more than 10,000 barrels daily in early 1937 to more than 500,000 barrels daily in mid-1940, down to 245,000 barrels daily in early 1941, back to 422,000 barrels daily in late 1941, and is now at the way station of 240,000 barrels daily on a long decline.

"I predict that within the brief period of 10-12 years, the Illinois oil industry will have gone from rags to riches and back to rags again. All of this will have been accomplished while approximately one billion barrels of oil are being produced. A few buccaneers will have made fortunes but the average oil producer, the average land-owner, and the state will have realized much less profit than they would have realized under orderly development. Moreover, the public will be poorer by the 300,000,000 to 500,000,000 barrels of oil which might have been recovered if well drawn and properly administered conservation laws had been in effect.

"Should we be so fortunate as to discover new pools of great capacity in your state, I can assure you that the bank-run pattern of Illinois development will not be repeated in Indiana during my tenure as Petroleum Administrator for War. The nation cannot afford such another spree. Beyond that, I can only hope that wiser counsel will prevail in your state in the future, and that it will provide itself with a proper conservation law at the earliest opportunity."

### P-98-b Correction

**Amended P-98-b provides that delivery orders where "total cost of all items is $1000 or more but no single item amounts to $500" should be submitted to PAW District Offices for approval. This is contrary to the statement in The Oil Weekly (April 5, page 100) which stated delivery orders of this type should be submitted to PAW's Washington office.**

# ODT Chief Promises East 1,511,000 Barrels Daily in 1944 First Quarter

Delivery into the Eastern States of 1,511,000 barrels of oil daily in the first quarter of next year, without any allowance for deep-water tanker movements to Atlantic ports, was assured April 13 by ODT Director Joseph B. Eastman, in a letter to 20 New England congressmen who had requested a "preview" of next winter's possibilities.

But, Eastman warned, PAW has made statements that military demands probably will absorb delivery increases and little easing of restrictions on civilian consumers could be expected. His own authority, the ODT head pointed out with apparent satisfaction, extends only to the provision of transportation.

Figures on future expectations provided by Eastman in the accompanying table are "most conservative," he said, and ODT is making every effort to see that they are surpassed with reasonable assurance of success.

The rail deliveries, Eastman said, do not take into account expedients like the shipment of oil in drums in box cars, container cars and lined cars which will add something to the movement.

**ODT Forecast of Deliveries by All Methods of Transportation into District 1**

April 1943 to March 1944, incl. (Thousands of barrels per day)

| PERIOD | Pipe Lines | BARGES | | | | Tankers Gulf-Florida | Tank Cars[4] | Total Transportation |
|---|---|---|---|---|---|---|---|---|
| | | Great Lakes | Miss.-Ohio | Gulf Intra-Coastal | Total | | | |
| 2nd Quarter—1943 | 212 | 39 | 35 | 70 | 144 | 30 | 885 | 1,271 |
| April | 204 | 8 | 35 | 65 | 108 | 30 | 860 | 1,202 |
| May | 216 | 50 | 35 | 70 | 155 | 30 | 897 | 1,298 |
| June | 216 | 60 | 35 | 75 | 170 | 30 | 697 | 1,313 |
| 3rd Quarter—1943 | 365 | 76 | 35 | 90 | 201 | 30 | 862 | 1,458 |
| July | 216 | 76 | 35 | 80 | 191 | 30 | 897 | 1,334 |
| August[1] | 365 | 76 | 35 | 90 | 201 | 30 | 854 | 1,450 |
| September[2] | 514 | 76 | 35 | 100 | 211 | 30 | 835 | 1,590 |
| 4th Quarter—1943 | 482 | 40 | 35 | 100 | 175 | 30 | 860 | 1,547 |
| October | 482 | 65 | 35 | 100 | 200 | 30 | 860 | 1,572 |
| November | 482 | 50 | 35 | 100 | 185 | 30 | 860 | 1,557 |
| December | 482 | 5 | 35 | 100 | 140 | 30 | 860 | 1,512 |
| 1st Quarter—1944 | 621 | 0 | 35 | 100 | 135 | 45 | 810 | 1,611 |
| January[3] | 621 | 0 | 35 | 100 | 135 | 35 | 810 | 1,601 |
| February | 621 | 0 | 35 | 100 | 135 | 50 | 810 | 1,616 |
| March | 621 | 0 | 35 | 100 | 135 | 50 | 810 | 1,616 |

[1] Completion of 24-inch line to Atlantic Seaboard estimated August 15, 1943. [2] Completion of 20-inch line to Norris City estimated September 15, 1943. [3] Completion of 20-inch line to Atlantic Seaboard estimated January 1, 1944. [4] Does not include transportation in drums.

## RFC Will Lend Money For Oil Development

The Reconstruction Finance Corporation is prepared to finance oil operations at a low rate of interest, but operators seeking money for development purposes will have to offer better security than the mere prospect of striking oil, Secretary of Commerce Jesse Jones advised Senator Joseph C. O'Mahoney of Wyoming last week.

In a letter to the Senator, Jones recalled that the directors of the RFC some time ago agreed to waive the requirement of participation by private lending institutions in loans to the industry, either established or in the development stage, and outlined the extent to which the agency was prepared to go in providing funds.

"Loans will also be made for refunding existing indebtedness where necessary to protect a borrower who may be unable to meet his payments due to loss of earnings through inability to maintain his production or secure proper storage or transportation facilities through lack of necessary priorities, all such loans to be so secured as reasonably to assure repayment," Jones said.

"The corporation will also make loans for development purposes where satisfactory security other than the prospect of striking oil can be offered. We recognize the desirability of carrying out the recommendation of the Senate Committee on Public Lands to establish loans for a longer term than may now be possible, in order to stimulate the search for new sources of oil.

"Loans may be made for such reasonable time as the security and circumstances justify, and the rate of interest will be four percent."

## California Crude Price Raises Extended

Extension to other heavy crude fields in California of the increased price granted 20 fields in its order of March 26 was announced April 12 by OPA.

An amendment to the oil-price schedule, effective immediately, established ceilings at the receiving tank in the other fields of the state at the regularly observed maximum prices plus an amount ranging from 1 to 25 cents per barrel, depending on the gravity of the oil, but with a provision that the maximum price for crude of a particular gravity shall not be less than that for

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a lower gravity crude from the same seller's receiving tank in the same pool.

The amendment also adds Wheeler Ridge to the fields in the No. 6 group granted similar increases March 26 and corrects an error in the earlier order which gave a price of 97 cents for 14-14.9-gravity crude produced at Olinda and Brea Canon fields; the correct figure is 95 cents.

In another order, OPA amended the discount provisions of the oil price schedule, as follows:

1. Sellers must allow discounts no less favorable than those allowed pursuant to and stated in contracts or invoices during the 60 days prior to the base pricing date, October 15, 1941; these discounts are to be deducted in determining the maximum prices established under the schedule.

2. Discounts, however, do not apply to specific dollars-and-cents prices established by the schedule, as the latter are net prices and discounts are not required under OPA regulations.

3. Deliveries pursuant to contracts of sale entered into more than 60 days prior to October 15, 1941, shall not be considered in determining discounts.

4. The base-price period is changed from October 1-15, 1941, to 60 days prior to October 15 to include a sufficient number of transactions.

### DeGolyer and Thomas Leave PAW Organization

E. DeGolyer, PAW's assistant deputy administrator in charge of production and reserves, has left the organization to return to his personal business. Ralph Davies, deputy administrator, and numerous oil operators have been urging DeGolyer to change his mind, but it appears unlikely that he will do so.

J. Elmer Thomas, who has been serving as a special assistant to Davies, largely in the field of prices, left the administration last week.

# Texas Allowable Boosted 60,000 Barrels For May; Hearing Makes Price Hike Plea

Higher prices for Texas crude oil were urged at a hearing before the Texas Railroad Commission in Fort Worth last week. Amon Carter, Fort Worth independent, declared oil was selling too low, and expressed the opinion that major companies are now buying oil with a base price of $1 which they expect to sell later when the price is nearer $2. He sponsored a resolution endorsed by oil operators present urging Congressional action for a higher price. He also praised the commission for its efforts along this line.

During the course of the commission's proration hearing, statements were read concerning the testimony of Prentiss Brown of OPA that he was willing to support an oil-price increase if the showing was made that it was necessary to the war effort, and the subsequent report that Ickes had testified as to the necessity of the raise.

Meanwhile operators were cheered by the announcement that PAW had increased the Texas recommendation for April by 60,000 barrels daily, up to a total of 1,562,000 barrels. Washington requested that 60,000 barrels more (included in the total above) be made available to the big-inch line immediately because plans for moving that amount of heating oil must be delayed until May 15. PAW asked for a minimum of 71,000 barrels of asphalt crude, of which 12,400 barrels is to go to the Houston area, 14,000 to New Orleans, 4600 to Beaumont and Port Arthur, and 36,100 daily to PAW District 1.

Nominations by purchasers totalled 1,670,142 barrels for May, up 15,275 over April. This included an increase of 16,868 barrels for Gulf Coast crude, much of which came from Humble Oil & Refining Company. East Texas field nominations were down 21,368 barrels daily, and East Central Texas dropped 6567 barrels. Most other areas had increases.

Humble asked for more Refugio light crude to be used in its Ingleside refinery, and announced that part of the remainder of the equipment is to be converted to other purposes, so that it will no longer be available for processing West Texas crude, at least until the war is over. The change over was made to comply with PAW instructions.

This led Amon Carter, with production in West Texas, to attack Humble for this change. He charged that the major companies had the men on the committees which make the recommendations, and indicated he thought the decisions were made to conform to changes in company policy. Much of the hearing was given over to a discussion of this situation. Baker said Humble would follow whatever recommendations PAW makes as a means of prosecuting the war.

More oil for the new Sinclair line from Corpus Christi to Houston and north was requested by Paul McDermott. He said the line would need 9000 barrels to make up 23,000 barrels from the Corpus Christi area. This is added to 30,000 barrels from East Texas and North Texas, and transported north into the Chicago area. He asked that allowables be raised for several Southwest Texas fields to the point where they were in April of 1942 before tanker shipments from Corpus Christi ceased.

Crown Central Petroleum Corporation asked for an increase of 8000 barrels from Hastings to supply its refinery, and Cities Service Oil Company wanted 10,000 barrels daily from Hawkins to fill asphalt contracts.

Sun Oil Company requested the commission to make statewide the rule permitting the transfer of allowables from high gas-oil ratio wells to low ratio wells. F. E. Heath said the practice had been approved by the commission for several fields and should be applied generally.

Bryan Payne asked that the commission revise its production tolerance rule to permit an overage of 20 percent or a maximum of 20 barrels daily, which ever is higher. This would apply to the state as a whole. He pointed out that this would cut in half the number of producing days in East Texas and permit a wider distribution of the limited labor supply.

This plan was endorsed by several engineers representing the major companies. Commissioner Culberson appeared to be opposed to the plan, but Commissioner Jester made no comment.

Operators voted the commission thanks for sending Commissioner Thompson to Washington to appear before various committees and urge an increase in price. He was expected to remain in Washington until Tuesday.

The first move to solve the Rodessa gas-waste situation was made as J. K. Baum, commission chief petroleum engineer, read into the record the results of tests his engineers have made in the field.

# Big Line Handles 265,000 Barrels Daily With Only Part of Its Pumps

Movement of East Texas crude oil through War Emergency Pipe Line, Inc.'s, 24-inch to Norris City, Illinois, attained a peak volume of 265,000 barrels daily on April 13, using only two of the trio of pumping units in each station. Supervising engineers are confident that the system will handle from 300,000 to 325,000 barrels daily on a regular schedule after adequate facilities are provided at Norris City.

The initial shipment of 320,000 barrels of heating oil was due to enter the big-inch late last week. This fuel was processed on the Texas Coast and was being pumped into the Longview tank farm by Pan-American Pipe Line Company's reversed line. Approximately 3,875,000 barrels of heating oil is scheduled to be handled by the 24-inch line during May, and 10 80,000 barrel steel tanks will be set aside at Longview for the product.

Sun-Yount-Lee Pipe Line Company's reversed 10-inch was authorized April 14 to start moving heating oil from Beaumont to Longview. Shell Pipe Line Corporation's Longview - Houston 10-inch is being held in readiness to reverse the flow and handle heating oils. The latter's crude runs from East Texas to Houston will be diverted to Sinclair Refining Company's 12-inch.

Minimum of 25,000 barrels of high-gravity crude daily, and an equal volume of heating oil will be available to the big-inch line from the Corpus Christi upon the completion of conversion work on the Southwest Emergency Pipe Line, Inc.'s line early in June. This former gas line, 150 miles of 14- and 16-inch, extends from Refugio terminal, near Corpus Christi, to Houston, and will have a rated capacity of 81,000 barrels daily. The heating oil will be turned to Shell Pipe Line Corporation at Houston, while 25,000 barrels of the daily crude movement from the Corpus Christi district will be routed through Sinclair Refining Company's system from Houston via Huffman to Beaumont, where Atlantic Pipe Line Company will make deliveries to the big-inch through reversal of its 10-inch carrier. Atlantic Pipe Line Company will then use Magnolia Pipe Line Company's facilities in moving oil from East Texas to Atlantic Refining Company's Atreco plant.

# Nation Producing and Refining More Crude Than Year Ago as War Requirements Mount

Both production and refinery processing of crude oil were increased substantially in the week ended April 10, production reaching a new peak for this year. But the higher runs to stills were not reflected immediately in output of refined products, the production of gasoline, distillate, and residual fuel oil having been somewhat less than in the previous week. Stocks of those products reflected those decreases in production, both gasoline and residual fuel oil having been withdrawn from storage, although some light fuel oil accumulated in the tanks.

In averaging 3,949,000 barrels daily in the week of April 10, crude oil production was 31,000 higher than in the previous week and 406,000 barrels (11.4 percent) higher than in the week of April 11 last year. For the 4 weeks ended April 10, 1943, United States crude production averaged 3,916,650 barrels per day, an increase of 298,350 barrels or 8 percent over the average of 3,618,300 barrels per day for the corresponding 4 weeks last year.

The increase in crude production since this time last year reflects increased capacity for moving oils overland across the United States, in substitution for tanker shipments, and also gives evidence of substitution of domestic crudes for South American and other oils formerly imported.

While the nation as a whole shows this substantial increase in crude production over a year ago, some states and districts are now producing less than at that time, while others show sharp increases. Most important decreases have been those in Illinois, Oklahoma, and Mississippi, although there are some other states and districts also producing less now than a year ago, including Nebraska, Arkansas, Indiana, Montana, and the Appalachian states. Almost wholly responsible for the national increase in crude production since a year ago are Texas and California, each of which states now is putting out nearly 200,000 barrels a day more than at that time. However, several other states also show increases, including Kansas, New Mexico, Louisiana, and Michigan. Shown herewith is a table comparing the current daily average production with that a year ago.

While domestic crude production is up more than 11 percent from this time last year, that gain reflects among other things, virtual shutting off of imports and substitution of United States oils, as previously stated, and refinery runs of crude therefore show increase smaller than that for United States production. Runs to stills averaged 3,677,000 barrels per day in the week ended April 10, up 53,000 from the previous week and up 175,000 barrels or 5 percent from a year previously. This increase in refinery runs gives evidence of the heavy use of petroleum for military, war production, and essential civilian purposes, which uses have more than compensated for curtailment of some normal consumption, as of gasoline and lubricants for automobiles.

In averaging 3,677,000 barrels per day in the week of April 10, crude runs to stills utilized 76 percent of the naton's refining capacity, with plants operating around 80 to 85 percent of capacity in all districts except the East Coast and Southwest and the Rocky Mountain area, where lower percentages of capacity were employed.

Residual fuel oil remains the most ur-

## Crude Oil Production in the United States

(Estimates compiled by The Oil Weekly. All figures indicate daily averages, in barrels.)

| STATE OR DISTRICT | PRODUCTION IN WEEK ENDED April 10 | April 17 |
|---|---|---|
| Arkansas | 70,700 | 71,200 |
| California | 778,100 | 775,300 |
| Long Beach | 33,300 | 32,350 |
| Midway-Sunset | 55,300 | 56,100 |
| Kettleman Hills | 44,500 | 43,900 |
| Wilmington | 94,600 | 94,650 |
| Rest of State | 550,400 | 548,300 |
| Colorado | 6,100 | 6,450 |
| Illinois | 269,350 | 226,950 |
| Salem | 30,900 | 30,400 |
| Louden | 45,050 | 42,100 |
| Other New Pools | 182,000 | 143,250 |
| Old Pools | 11,400 | 11,200 |
| Indiana | 15,850 | 15,900 |
| Kansas | 309,300 | 310,300 |
| Kentucky | 13,400 | 13,150 |
| Louisiana | 346,900 | 346,950 |
| North | 89,100 | 88,900 |
| South | 257,800 | 258,050 |
| Michigan | 56,150 | 60,700 |
| Mississippi | 55,250 | 56,250 |
| Missouri | 95 | 95 |
| Montana | 21,600 | 20,400 |
| Nebraska | 2,100 | 2,150 |
| New Mexico | 97,300 | 97,300 |
| New York | 15,200 | 13,800 |
| Ohio | 11,900 | 11,650 |
| Oklahoma | 344,100 | 339,850 |
| Oklahoma City | 59,450 | 57,150 |
| Seminole Area | 79,250 | 78,850 |
| Rest of State | 205,400 | 203,850 |
| Pennsylvania | 48,050 | 44,500 |
| Tennessee | 35 | 35 |
| Texas | 1,390,150 | 1,390,450 |
| Upper Gulf Coast | 340,950 | 340,800 |
| East Texas Field | 320,150 | 320,050 |
| Rest of Eastern Texas | 99,850 | 100,050 |
| Lower Gulf Coast | 116,950 | 117,150 |
| Southwest Texas | 54,050 | 54,600 |
| South Central Texas | 17,000 | 17,050 |
| West Texas | 214,550 | 214,450 |
| North Texas | 135,300 | 135,100 |
| Panhandle | 91,350 | 91,200 |
| Utah | 10 | 10 |
| West Virginia | 9,250 | 9,100 |
| Wyoming | 94,800 | 92,500 |
| Total United States | 3,955,690 | 3,904,990 |

## Trends of Operations and Changes in Stocks

Figures on crude stocks are from Bureau of Mines weekly reports; all others from American Petroleum Institute weekly reports, which are estimates on Bureau of Mines basis.

**(All figures in thousands of barrels—add 000)**

| ITEM | Crude Oil Prod. Barrels Daily | Week Ended | Runs to Stills Barrels Daily | Week Ended | Crude Stocks Barrels | Week Ended | Gasoline Stocks Barrels | Week Ended | Gas Oil & Distillate Stocks Barrels | Week Ended | Residual Fuel Oil Stocks Barrels | Week Ended |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Highs:** | | | | | | | | | | | | |
| 1939 | 3,910 | 8- 5 | 3,650 | 10–21 | 278,607 | 5–26 | 87,769 | 4–22 | 39,562 | 10–28 | 116,237 | 8–26 |
| 1940 | 3,890 | 3–16 | 3,690 | 6–22 | 265,865 | 8–31 | 102,817 | 4–20 | 49,051 | 10–19 | 109,135 | 9–14 |
| 1941 | 4,337 | 11–22 | [1]4,120 | 10–18 | 266,187 | 3–29 | 99,727 | 3–29 | [1]54,983 | 11–15 | 102,448 | 1– 4 |
| 1942 | [1]4,337 | 2– 7 | 3,961 | 1– 3 | 263,208 | 3–28 | [1]109,281 | 3–14 | 49,861 | 11–14 | 95,857 | 1– 3 |
| 1943 | 3,949 | 4–10 | 3,734 | 3–27 | 239,864 | 4– 3 | 94,159 | 3–20 | 42,913 | 1– 2 | 72,881 | 1– 2 |
| **Lows:** | | | | | | | | | | | | |
| 1939 | [3]1,601 | 8–26 | 3,125 | 2–18 | [2]229,127 | 10–12 | 71,152 | 10– 7 | 20,722 | 4–15 | 105,397 | 4– 8 |
| 1940 | 3,335 | 11–30 | 3,370 | 1– 6 | 237,339 | 1–27 | 79,847 | 11– 9 | 23,551 | 4– 6 | 102,344 | 2–10 |
| 1941 | 3,364 | 1–11 | 3,490 | 1–18 | 240,399 | 11–15 | 79,923 | 10– 4 | 28,381 | 4–12 | 90,914 | 7–12 |
| 1942 | 3,297 | 7– 4 | 3,393 | 5–23 | 231,896 | 12–12 | 75,934 | 12– 5 | 29,240 | 4–25 | 72,962 | 12–26 |
| 1943 | 3,821 | 1– 9 | 3,579 | 3–13 | 232,191 | 1– 9 | 82,420 | 1– 2 | 30,732 | 4– 3 | 67,185 | 4–10 |

| Trends in Week Ended: | Crude Oil Production Daily | Crude Oil Runs to Stills Daily | Crude Oil Stocks Week End | Gasoline Production Weekly | Gasoline Stocks Week End | Gas Oil and Distillate Production Weekly | Gas Oil and Distillate Stocks Week End | Residual Fuel Production Weekly | Residual Fuel Stocks Week End |
|---|---|---|---|---|---|---|---|---|---|
| **1942:** | | | | | | | | | |
| January 3 | 4,038 | 3,961 | 244,440 | 13,797 | 92,987 | 3,855 | 49,357 | 6,918 | 95,857 |
| January 31 | 3,871 | 3,848 | 250,740 | 13,292 | 97,810 | 3,817 | 40,674 | 6,640 | 91,189 |
| February 28 | 4,016 | 3,675 | 259,373 | 12,131 | 105,635 | 3,799 | 34,547 | 6,813 | 88,285 |
| March 28 | 3,820 | 3,667 | 263,208 | 11,663 | 105,624 | 3,661 | 31,756 | 6,344 | 83,045 |
| April 25 | 3,581 | 3,506 | 257,073 | 10,535 | 102,897 | ..... | 29,240 | ..... | 81,107 |
| May 30 | 3,877 | 3,522 | 255,023 | 10,478 | 95,355 | ..... | 31,384 | ..... | 79,628 |
| June 27 | 3,719 | 3,581 | 253,364 | 10,713 | 88,396 | ..... | 32,851 | ..... | 77,304 |
| July 25 | 3,691 | 3,658 | 249,262 | 10,864 | 82,281 | ..... | 35,966 | ..... | 77,816 |
| August 29 | 3,964 | 3,697 | 249,007 | 11,300 | 80,831 | ..... | 42,060 | ..... | 78,034 |
| September 26 | 3,909 | 3,802 | 242,785 | 10,954 | 80,550 | ..... | 45,945 | ..... | 78,943 |
| October 31 | 3,901 | 3,731 | 239,266 | 11,153 | 79,159 | ..... | 48,131 | ..... | 79,166 |
| November 28 | 3,878 | 3,736 | 234,850 | 11,269 | 78,854 | ..... | 49,739 | ..... | 77,796 |
| **1943:** | | | | | | | | | |
| January 2 | 3,871 | 3,734 | 233,938 | 10,957 | 82,420 | 4,285 | 42,913 | 7,683 | 72,881 |
| January 30 | 3,826 | 3,698 | 233,863 | 10,339 | 88,830 | 3,888 | 37,057 | 7,452 | 70,763 |
| February 27 | 3,873 | 3,709 | 235,217 | 10,566 | 93,157 | 4,230 | 32,939 | 7,839 | 70,140 |
| March 27 | 3,896 | 3,742 | 239,126 | 10,231 | 94,079 | 3,541 | 30,980 | 8,018 | 67,938 |
| April 3 | 3,918 | 3,624 | 239,864 | 10,361 | 93,409 | 3,903 | 30,732 | 8,209 | 67,483 |
| **April 10, 1943** | **3,949** | **3,677** | ..... | **10,182** | **93,212** | **3,823** | **30,906** | **7,681** | **67,185** |
| April 11, 1942 | 3,543 | 3,502 | [4]261,768 | 10,718 | 105,566 | 3,267 | 29,567 | 6,869 | 81,947 |
| **Change:** | | | | | | | | | |
| In week | +31 | +53 | +738 | —179 | —197 | —80 | +174 | —528 | —298 |
| In year | +406 | +175 | —21,904 | —536 | —12,354 | +556 | +1,339 | +812 | —14,762 |
| In year | +11.4% | +4.9% | —8.3% | —5.0% | —11.7% | +17.0% | +4.5% | +11.8% | —18.0% |

[1] All time peak. [2] Lowest since April, 1922. [3] Lowest since October, 1922, due to shutdown of six Mid-Continent States. [4] Stocks, April 4, 1942.

gently needed product, and it was necessary to take about 300,00 barrels more from storage in the week of April 10. That withdrawal was explained in part by the fact that production was 528,000 barrels lower than in the previous week. All districts showed withdrawals from storage and drafts in all districts were accentuated by declines in production, although California showed outstanding decreases in production and stocks, while the East Coast-Southwest districts showed only nominal changes in both production and stocks. The nation now has in the tanks 67,000,000 barrels of heavy fuel oil, compared with 82,000,000 barrels a year ago, a decrease of 15,000,000 barrels or 18 percent.

### Adding Fuel

The critical period of heating-oil scarcity having passed, the industry added 174,000 barrels of gas oil and distillate fuel to storage in the week ended April 10, in the face of production of 80,000 barrels less than in the previous week. Stocks of 30,906,000 barrels April 10 were 1,339,000 barrels (4.5 percent) above those held on April 11 last year. Production is being held up at a comparatively high level for this time of the year, in a deliberate plan to build up storage during the spring and summer for taking care of next fall and winter's use. The 3,823,000 barrels produced in the week of April 10 was 556,000 barrels (17 percent) in excess of output in the week of April 11 last year.

Production of gasoline was held closely in line with current production. Stocks were reduced 197,000 barrels, or practically the same amount by which current production was lowered for the week as compared with the previous week. The spring peak for gasoline stocks apparently has been passed, inventories of 93,212,000 barrels on April 10 having been about a million barrels under the year's high reached on March 20. The present inventory is 12,000,000 barrels (12 percent) less than that of about 105,500,000 barrels on hand at this time last year. All districts showed decreases in production and storage of gasoline in the week of April 10 except California and the Rocky Mountain states.

**Daily Average Crude Oil Production Differs from Year Ago for Most States; Up 8 Percent for Nation.**

(Figures from American Petroleum Institute)

| State or District | 4 Weeks Ended April 11, 1942 (Barrels Daily) | 4 Weeks Ended April 10, 1943 (Barrels Daily) | Difference From Year Ago (Barrels Daily) | Percent Difference From Year Ago |
|---|---|---|---|---|
| Oklahoma | 390,250 | 344,050 | — 46,200 | —12 |
| Kansas | 237,600 | 312,100 | + 74,500 | +31 |
| Nebraska | 4,200 | 2,250 | — 1,950 | —46 |
| Texas | 1,199,250 | 1,391,900 | +192,650 | +16 |
| Panhandle | 83,500 | 89,200 | + 5,700 | + 7 |
| N. Texas | 140,150 | 136,500 | — 3,650 | — 3 |
| West Texas | 202,450 | 217,150 | + 14,700 | + 7 |
| E. Central | 83,250 | 99,750 | + 16,500 | +20 |
| East Texas | 278,200 | 322,500 | + 44,300 | +16 |
| Southwest | 164,650 | 176,950 | + 12,300 | + 7 |
| Coastal | 247,050 | 349,850 | +102,800 | +42 |
| Louisiana | 330,700 | 341,500 | + 10,800 | + 3 |
| North | 80,950 | 89,100 | + 8,150 | +10 |
| South | 249,750 | 252,400 | + 2,650 | + 1 |
| Arkansas | 75,600 | 70,900 | — 4,700 | — 6 |
| Mississippi | 95,500 | 55,350 | — 40,150 | —42 |
| Illinois | 313,550 | 240,600 | — 72,950 | —23 |
| Indiana | 19,000 | 15,400 | — 3,600 | —19 |
| Eastern | 99,900 | 94,600 | — 5,300 | — 5 |
| Michigan | 50,000 | 57,250 | + 7,250 | +14 |
| Wyoming | 90,700 | 90,500 | — 200 | — 0.2 |
| Montana | 21,500 | 18,400 | — 3,100 | —14 |
| Colorado | 5,400 | 6,600 | + 1,200 | +22 |
| New Mexico | 86,700 | 93,650 | + 6,950 | + 8 |
| California | 598,450 | 781,600 | +183,150 | +31 |
| Total U.S. | 3,618,300 | 3,916,650 | +298,350 | + 8 |

## Markets Generally Tight; Crude Raise Still Talked

Speculation on the possibility of a general crude price increase continues prominent in connection with the industry's markets, with refiners and marketers concerned as to whether a crude raise would be accompanied by proportional increases in prices of refined products. Refiners have some misgivings that they may lose if crude is advanced, as it has been intimated from the Office of Price Administration that the refining division may be forced to absorb a part of the increase in cost of the raw material. Some members of Congress also have subscribed to the thought that higher crude costs might be absorbed by those who handle the oil after sold by the producer, although it has not been made clear that the added costs actually could be absorbed, especially by smaller, independent refiners, who do not have the larger possibilities of effecting economies that fully integrated companies have, through pipe line and marketing as well as refining operations.

Oil industry markets meanwhile are generally tight, as supplies remain light in relation to demand in the case of most products. In the East Coast district gasoline is reported especially scarce, with stocks at bare working levels in reflection of the ban on shipments of that product. Improvement of transportation from the Middle West to the East is regarded by Eastern suppliers as an objective to be sought.

Most products continue in strong demand in the Western Pennsylvania refining districts, although there is still some weakness of neutral oils, which nevertheless have shown considerable improvement in recent weeks. Bright stocks and cylinder stocks remain extremely scarce.

In the Middle West, there is continued heavy demand for both industrial and heating fuel oils, while the demand for gasoline is perceptibly increasing, with advent of warmer weather and increased agricultural activity. Lubricating oils also are in good demand in the district.

Seasonal factors are reflected in the markets of the upper Mid-Continent. Warmer weather has reduced the demand for No. 1 and No. 2 fuel oils and for kerosine, but the demand for gasoline and tractor distillate continues to increase. Lubricants meanwhile have grown increasingly firm, and discounts from posted prices are being narrowed or eliminated.

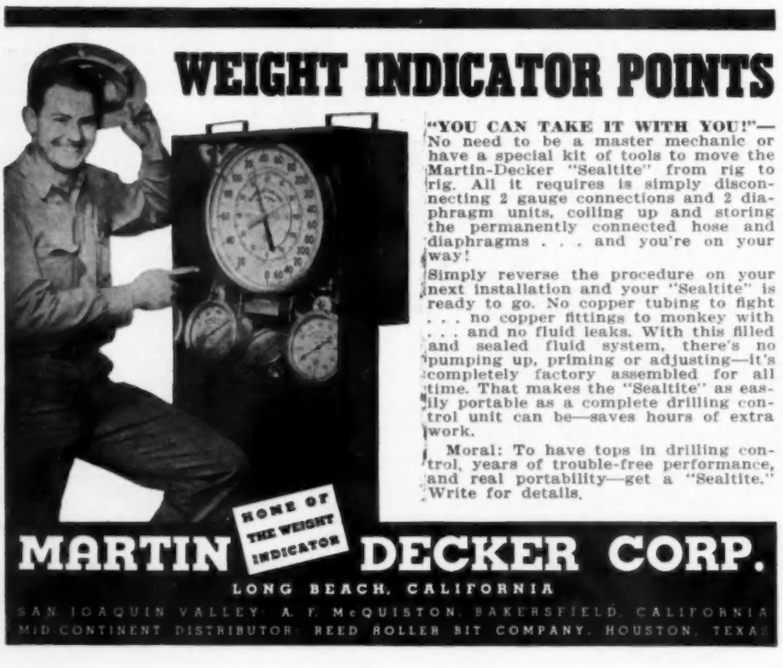
On the Gulf Coast there is continued good demand for kerosine and gasoline, although stocks of the latter are quite adequate for meeting somewhat larger call. Light fuel oil is being fed into the "Big Inch" pipe line, while some kerosine is being shipped to the East in drums. Bunker oil is said to be in good demand, along with aviation gasoline.

## 100-Octane Gasoline Unit Completed at Port Arthur

Completion of a new Houdry catalytic cracking unit that will greatly increase the production of 100-octane aviation gasoline, at Port Arthur, has been announced by Gulf Oil Corporation. Since 1938, the company's facilities for producing this super fuel have been expanded almost continuously, each new unit embodying the latest technological developments. Expenditures in this development program have amounted to approximately $15,000,000.00.

## West Texas Crude Sale

Magnolia Petroleum Company has sold 200,000 barrels of crude from the Slaughter and Seminole fields, West Texas, to Atlantic Refining Company at posted price, plus regular transportation tariff. This oil is being delivered by Magnolia Pipe Line Company at rate of 10,000 barrels daily to Atlantic Pipe Line Company's West Texas terminal at Midland.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# Hungary Furnishing Most Important Developments in Continental Europe

HUNGARY has been furnishing some of the more important developments of the continent of Europe in petroleum exploitation in recent years, having yielded increased production of crude oil, while development of gas reserves is in progress.

Plans are being carried out for construction of pipe lines for natural gas from northern Transylvania to Cluj and other Hungarian industrial towns. Through use of public and private capital, a new company has been formed for exploitation of gas deposits, which will help to replace imported solid fuels, according to British trade reports.

Transylvania Mineral Gas A. G. has been established in Neumarkt, Hungary, with capital of 10,000,000 pengos (nearly $2,000,000). One half of the capital was subscribed by the government, and 2,000,000 pengos have been subscribed by the Transylvanian towns and their larger industrial concerns.

The German press last fall stated that Pet Nitrogen Superphosphate Works, A. G., was planning to establish a lubricating oil refinery in Hungary at a cost of 6,000,000 pengos (over $1,000,000), for processing domestic mineral oils, in the expectation of supplying a considerable part of the Hungarian lubricating-oil market.

The largest increase in petroleum production in all European countries in 1942 was that in Hungary. Crude oil output for the year is estimated at 3,800,000 barrels, compared with 2,600,000 in 1941, an increase of almost 50 percent. (THE OIL WEEKLY, February 22, 1943, p. 42.) In addition, Hungary was estimated to have produced about 200,000 barrels of petroleum substitutes in 1942, against 100,000 in 1941.

Hungary's crude oil production has risen to the present important proportions from insignificant output several years ago. In 1936 the production was only about 100 barrels, but subsequently it has increased as follows:

| Year | Barrels Production |
|---|---|
| 1937 | 16,000 |
| 1938 | 288,000 |
| 1939 | 1,103,000 |
| 1940 | 1,755,000 |
| 1941 | 2,600,000 |
| 1942 | 3,800,000 |

In each of the past two years, Hungary produced substantially more petroleum and substitutes than required to meet domestic needs. The domestic demand was only about 1,500,000 barrels in 1941, and on that basis, there were available above the domestic needs over 1,000,000 barrels in 1941 and more than 2,000,000 barrels in 1942. It is indicated that Germany is demanding and receiving a share of the Hungarian production. However, Hungary's total output within itself represents only a little over 3 percent of the production of petroleum and substitutes for European axis countries and controlled areas, such production having been about 112,000,000 barrels in 1942—20 percent higher than in 1941.

Around the beginning of 1941, a German company obtained a concession for exploration and exploitation in the southeastern part of Hungary, in evidence of keen interest of the Germans in petroleum development of the country.

However, the important expansion of the Hungarian oil industry up to now has been largely the fruit of Hungarian-American initiative, which was responsible for development of the country's principal production, in the region of Budafapuszta, in the southwestern part of Hungary, adjacent to the Yugoslavian border. The production there is around the producing area formerly known as the Lispe field, although that original pool has been extended by additions of at least two other productive areas.

The increases in production in 1941 and 1942 reflected discovery of the producing area at Lovaszi around the beginning of 1941. The first several wells completed there produced around 800 barrels of 39-gravity oil per day from formation at 4950 to 5400 feet. Original development was with rotary equipment from the United States, although subsequent drilling employed equipment made by German manufacturers. The field was developed by Magyar Amerikai Iilijipari, R. T. (Hungarian-American Oil Industries Company) of Budapest, a concern branching off from European Gas & Electric Company, of Wilmington, Delaware, and Vienna, Austria, which in turn is a subsidiary of Standard Oil Company. (New Jersey).

In the older field at Budafapuszta, formerly called Lispe, latest available reports indicated about 40 wells on production. In 1940 that area averaged about 5000 barrels per day of 41-gravity production from 3950 to 4950 feet. Drilling was by rotary.

(Across the border from Lovaszi and Budafapuszta, in Yugoslavia, are two small oil fields, Selenico and Peklenico, each yielding around 10 barrels per day. Those fields are operated by Yugo-Petrol group (formerly Rudokop, in which the A.G.I.P. of Rome acquired controlling interest in early 1941).

Production and reserves in the Budafapuszta and Lovaszi fields were considered sufficiently important to justify construction of a pipe line from Budafapuszta to Budapest (about 125 miles). The line was scheduled to have capacity of 37,000 barrels per day, and was near completion after several wells had been completed in the Lovaszi area. From the main line there was projected a branch line leading to a refinery and river transportation at Acs.

In early 1941 an exploration and exploitation concession, good for seven years, and covering an extensive area in southeastern Hungary, east of the Danube River, was obtained by the German potash company, Wintershall, A.G., which is affiliated with the Elwerath Company, of Hannover, and which carries on both production and refining of petroleum in Germany. The concession extends to the Hungarian-Rumanian border on the east and about half way from the southern border of Hungary to Budapest.

## Gaspe Peninsula Deep Test Will Start Drilling Soon

Drilling is expected to be under way between May 1 and May 10 on Continental Petroleum, Limited's, projected 8000-foot wildcat, C.P.L. No. 1 on the Galt Brook dome in Gaspe Peninsula of Canada at the lower stretches of the St. Lawrence River. Most of the equipment is installed and foundations for the derrick are being completed. Camp buildings have been completed and all supplies and machinery are on the location.

Continental Petroleums, Limited, of Montreal, has an 85,000-acre property in the area, and besides the above-mentioned deep test, will drill C.P.L. No. 2, a 2500-foot test, in the vicinity of an old well which yielded high-gravity oil.

Location of Hungarian fields and pipe line

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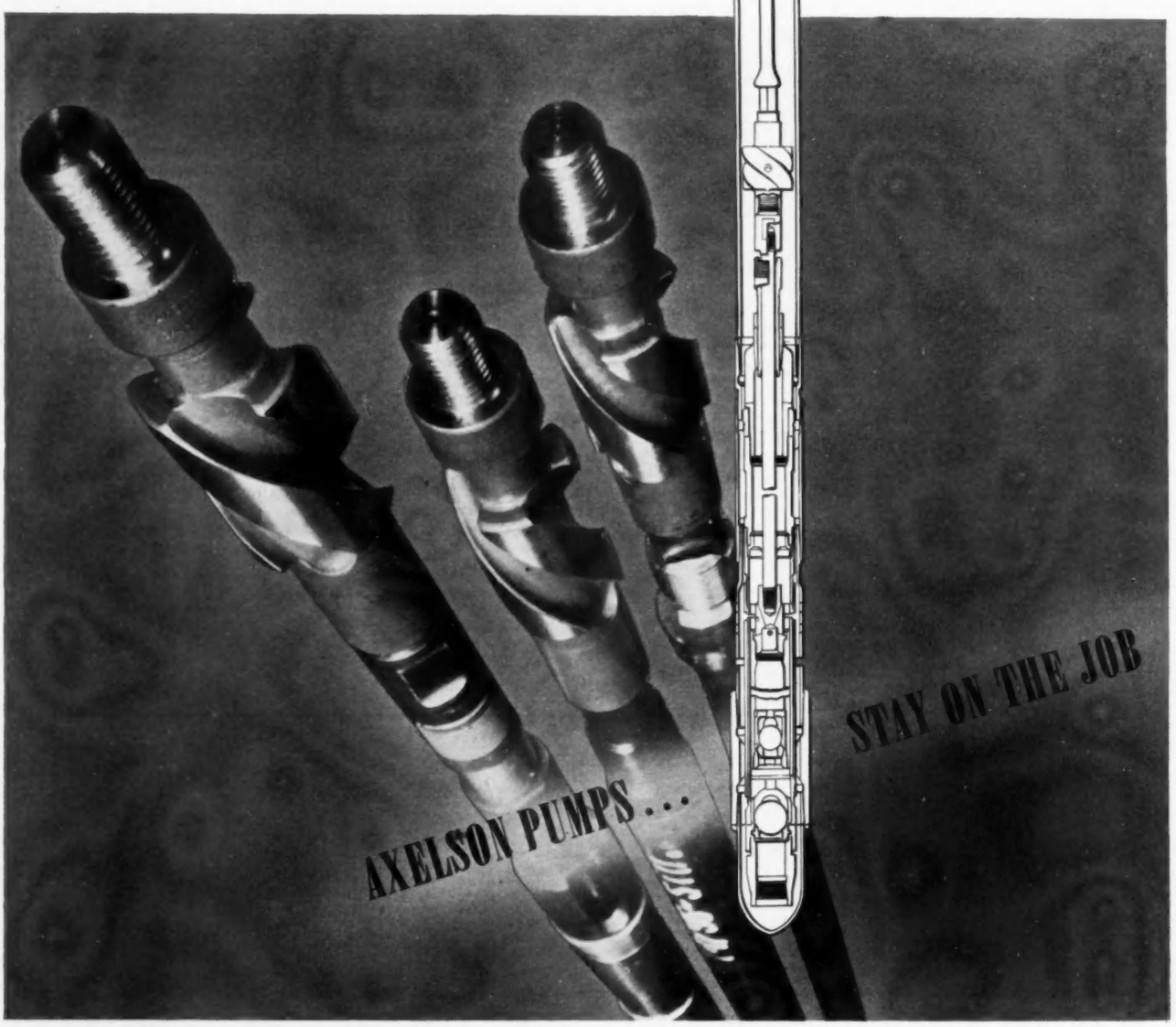


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# U. S. Field Operations

## Illinois

### Wildcat Tests Started In Unexplored Counties

Lario Oil & Gas Company's Franklin County Mining Company 3, NE SW SW 36-6s-4e, Franklin County, 1½ miles south of the new South Akin field, was scheduled to begin completion in Aux Vases sand at 3122-27 feet. Total depth is 3142 feet and 7-inch casing was set at 3105 feet.

**Moultrie County:** Continental Oil Company's Beachy 1, NE NW NE 13-15n-6e, 11 miles west of Tuscola, found a spotted oil show in Trenton lime at 3645-63 feet and was making drill-stem test. On an earlier drill-stem test at 3513-3627 feet, 45 feet of drilling mud and no oil were recovered in 45 minutes. The test was cored from 3627 to 3645 feet but no saturation was found. There is no production in the county.

**Green County:** E. S. Brooks' Valley Farms 2, N WSE 30-11n-13w, 7½ miles northwest of Carrollton, was scheduled to begin drilling below surface casing. There has been little exploration in the county.

**Effingham County:** Location has been staked for Watkins & Hawkins' Webster 1, NW SE NW 34-6n-6e, 6 miles east of the Mason pool.

**Monroe County:** Gawter & Braun's Dill 1, NW NW NE 13-3s-10w, 4 miles south of Waterloo, has been spudded. There is no production in the county.

**St. Clair County:** Whitten et al's J. Grossman 1, NW NW NE 24-1s-9w, a wildcat midway between Waterloo and Belleville, was drilling at 100 feet.

## Oklahoma

### New Osage County Pool Producing from Layton

The Pure Oil Company's Cox 1, SE SW SE 15-5n-8e, Cimarron County wildcat on a large block of acreage, has run 7-inch casing prepartory to testing. Location is in area west of the Hugoton-Amarillo gas trend.

**Oklahoma County:** Abe Gutowsky et al's Wagner 1, NWc SW 32-14n-4w, 3 miles west of Edmond field, plugged back from 7676 feet, is testing Hunton lime after perforating casing at 6952-57 feet. The well made a total of 350 barrels of 41-gravity oil in head flows during 12 hours of testing without acid. Operators continue to check pressures and productivity without a conclusive gauge being made. Tubing is being run for further testing.

**Garvin County:** Ohio Oil Company is preparing to drill a relief well just south of Burns 1, SE NE SW 17-3n-2e, which is still out of control after encountering an estimated 75,000,000 cubic feet of dry gas in Pennsylvanian sand at 2876 feet. When a four-way connection was stabbed and partially closed, the well attempted to crater and decision to drill the relief well was made.

**Osage County:** A. G. Oliphant and C. B. Peters' Osage 1, NE NE SW 20-25n-3e, opens a new field 6 miles southeast of Ponca City field, with pay in Layton sand topped at 2805 feet. When plug was drilled to test saturation at 2850-75 feet, the well flowed 157 barrels of oil in 24 hours. On a second test, the well swabbed 170 barrels of oil and no water in 18 hours. Hole was plugged back for Layton test after Bartlesville failure.

## Kansas

### Trapp Area Extension May Be New Field

Vernon Oil & Gas Company's Barrett 1, SE NE SE 36-16-14w, Barton County, two miles south of the Trapp field, is an Arbuckle lime producer, and in view of its greater yield than edge wells of the Trapp field may as well be considered a field opener as an extension. Arbuckle was treated with 500 gallons of acid at 3428 feet and swabbed 12 barrels of 40-gravity oil per hour. The well later filled with 3300 feet of oil in 18 hours. Arbuckle was encountered at 3428 feet with total depth 3465 feet.

**Reno County:** E. G. Bradley and associates have extended the Peace Creek field northwest with D. D. Russell 1, C NW SW 33-22s-10w, which is producing from Viola lime at 3572-3605 feet. After plugback from Arbuckle, casing was perforated with 96 holes and the well made a bailer of oil per hour. Operators planned to acidize.

Skelly Oil Company's Johnson 1, C SW NE 6-24-10w, most northeasterly test in the Viola lime area of Zenieth field, flowed 115 barrels in 4 hours initially and on test made 244 barrels in 6 hours through 1-inch choke and on second test made 103 barrels in 1½ hours through 1-inch choke, the latter production being through casing. Total depth is 3735 feet, Viola lime being topped at 3705 feet and saturation at 3721 feet. The test, as yet incomplete, is further evidence of the direct relationship between Peace Creek and Zenith production, there being somewhat less than two miles of untested area separating the two fields. A north offset to Johnson 1 is drilling at 1850 feet.

## West Texas

### New Production; Record Depth in Winkler County

Magnolia Petroleum Company's Walton-State 20, C NW NW PSL 4, Block B-3, and 3½ miles west of big gas-distillate strike on Keystone structure, opened second Ellenburger producing area for Winkler County and established new producing depth record for Permian Basin with rated flow of 12,800,000 feet of gas with spray of distillate daily on 15-minute drill steam test at 10,468-10,489 feet. Previous test at 10,457-10,469 feet yielded gas at rate of 1,930,000 feet daily, based on last 5 minutes of 30-minute drill steam test. Drill pipe yielded 450 feet of 55.1-gravity distillate. Production is from Ellenburger, topped at 10,460 feet with elevation of 2934 feet, being 1266 feet low to the Keystone field discovery. Coring was resumed at 10,489 feet, with oil anticipated as the dolomite showed improved porosity the last foot. This wildcat is carrying open hole below 7-inch seat at 8322 feet. It is near center of company's 9½-section lease, with regular Permian production on the north and west edges.

Amon G. Carter et al's Walton-Pure 2-C, recent Ellenburger discovery for Keystone structure, added to its unusually thick section of gas-distillate producing zone in testing at 9470-94 feet. Tester was open 1 hour, and at the end of 18 minutes the gas flow was rated at 12,290,000 feet daily, and at rate of 10,740,000 feet daily when tool closed. Distillate was rated at 16½ barrels hourly, based upon 40-minute test through separator. Coring was resumed to try for oil production. This strike entered Ellenburger at 9215 feet with elevation of 2955 feet, and tester has been used at regular intervals, resulting in proportionate yield of gas and distillate.

**Blowout:** Magnolia Petroleum Company and Anderson-Prichard Oil Corporation's Powell-State 1, C W¼ S¼ H&GN 96, Block 10, 1½ miles northeast of Apco field, first Ellenburger producing area in Pecos County, blew out after attempting to cement off cavity at 3552-55 feet in Permian, flowing in excess of 150 barrels of oil per hour. Water began showing within 5 hours, and at the end of 7 hours the flow had declined to 35 barrels hourly, including 90 percent sulphur water. The flow was due to be mudded off to continue to the Ellenburger objective. Powell-State 1 is structurally high, having topped Yates sand at 990 feet with elevation of 2405 feet.

**Yates Deep:** Standard Oil Company of Texas' Douglas 1, southwest edge of the Yates field and the first try for deep production within or near the Yates structure, has failed to encounter any shows of consequence in drilling Permian to 6010 feet. Ellenburger failure in Crockett County and 3 miles east of Yates production recorded numerous shows below regular Permian. Yates field has been rated as outstanding deep prospect due to its unusual structure and prolificness.

**Clear Fork Tests:** Amerada Petroleum Corporation's Robertson 6, C NW SE WT 196, has been contracted to 8500 feet to explore the Clear Fork on the east edge of the Seminole field. In Yoakum County, Humble Oil & Refining Company's Tannehill 1, 3 miles southwest of Wasson field, was drilling lime at 6275 feet. John R. Sharp et al's Martin-Stanolind 1, western Lubbock County, entered barren Glorietta at 5290 feet, and was drilling lime at 5780 feet, possibly in Clear Fork.

**Crockett County:** Moore Brothers et al's Todd-Amerada 1, wildcat that showed promise of oil production in Crinoidal at 6790-6876 feet, was drilling dry dolomite at 7855 feet in Ellenburger, topped at 7645 feet, 550 feet low to West Todd one-well pool 5 miles east.

## North Texas

### Votsberger Pool Becoming Active Drilling Center

Votsberger pool in northeast Archer County is in line to become the most active drilling center in North Texas as result of the uncovering of more prolific wells and extensions. Tom Medders and W. D. Cline's Votsberger 1 extended the field ¾ mile southeast, flowing by heads after nitro shot in Strawn at 4750-94 feet.

Medders et al's Fuller 1, southwest outpost and separated from production by a 5159-foot failure, set pipe at 5454 feet in Ellenburger, topped at 5440 feet, to test. This test also indicated production in conglomerate overlying Ellenberger.

**Cooke County:** Basal Strawn pay recently opened on the east flank of Walnut Bend field accounted for two more flowing wells. Sinclair Prairie Oil Company's Cox 10-B, flowed 76 barrels on 3-hour test through 1-inch from perforations in Winger sand at 5374-5444 feet, and Cox 11-B flowed 151 barrels in 3 hours from perforations at 5382-5420 feet.

**Wichita County:** E. C. Oil Company's LeBus 9-E, W. H. Spillers Survey, extended Ellenburger production in K-M-A field southeast with natural flow of 338 barrels of 42-gravity oil initial through 2-inch from dolomite at 4248-60 feet. More development to follow to east and south.

**Young County:** Panhandle Refining Company et al's Mayes 1, southwest portion of S. Anderson Survey, opened new deep pay on southeast edge of the Allar 2700-foot Strawn pool, in flowing 72 barrels of oil the first hour through ¾-inch after using 2000 gallons of acid in Bend at 3552-72 feet. Top of Bend is 33 high to a 3658-foot failure on the north edge of the pool.

### Several Wildcats Have Discovery Indications

The East Texas basin has a bumper crop of oil discoveries pending, with Paluxy strikes in Smith, Hunt and Wood counties. Travis Peak prospect in Franklin County has logged 90 feet of probable oil producing sand, and the Barron pool, near Groesbeck, is giving the district its first production from the Upper Glen Rose.

**Smith County:** C. L. Wickliffe and Talbert's Hackett-Pure 1, Samuel Leeper Survey, scheduled 9700-foot test for the Sand Flats prospect, recovered 60 feet of oil-cut mud, 540 feet of 23.5-gravity oil and 630 feet of salt water on 15-minute drill-stem test at 7281-7307 feet. Production is from Paluxy, topped at 7261 feet with saturated sand at 7280-7304 feet, elevation 469 feet. Test was drilling 7455 feet, and depth contract will be fulfilled before attempting to complete. This wildcat is in the low part of the Tyler basin.

**Hunt County:** Stanolind Oil & Gas Company's Tilson 1, 1¾ miles northwest of Campbell and on a narrow faulted structure, revived prospects of giving the county its first Paluxy field, in swabbing 10 to 20 percent oil with water after excluding lower perforations. Tankage is being installed with expectation of making a commercial pumper after water is exhausted. Production is from Paluxy sand at 4372-84 feet.

**Franklin County:** Tide Water Associated Oil Company-Seaboard Oil Company's Bacon 1, Block 12, John Maximillian Survey, strengthened its prospects of oil production from Travis Peak sand, topped at 7908 feet, in logging an aggregate of 90 feet of probable oil-bearing formation in coring to 8004 feet. Bacon 1 was coring silty shale at 8042 feet, elevation 435 feet, and will go to water, or 300 feet into the Travis Peak before halting to run pipe for completion. This wildcat passed up possible gas-distillate production in the Rodessa at 7279-7304 feet.

**Wood County:** Bobby Manziel et al's Bailey-Shell 1, Samuel Burch Survey, 4 miles southeast of Coke field but separated from the latter by a decisive failure, was awaiting perforations to complete in about 25 net feet of oil sand in Paluxy between 6242 and 6361 feet. It is conceded to be forerunner of a new pool, or a major extension to the Quitman field, situated 6 miles southwest.

Productive limits of the Quitman field were advanced a mile northeast when Roger Lacy et al's Stone-Johnson 1, Hazard Anderson Survey, flowed 30 barrels of oil hourly on initial test from perforations at 6310-35 feet in Paluxy sand, topped at 6302 feet with elevation of 446 feet. Estimates on pay thickness ranged from 30 to 39 feet. Acreage proved by this outpost will be drilled up promptly, although operators are experiencing difficulty in marketing their oil allowable since Gulf Refining Company curbed its receipts of oil delivered by tank trucks. A new outlet involves truck hauls to Gladewater refinery.

**Limestone County:** Bert F. Weekley et al's Strother 1-A, north offset to single oil producer in Barron pool, yielded an undetermined volume of 19-gravity oil and rotary fluid on swabbing test after reperforating at 4570-90 feet, and will be acidized. Production is from Upper Glen Rose saturation, with more promising pay at 4770-4805 feet and in Pettit at 5684-5742 feet. This is the first production from Upper Glen Rose in district.

**Van Zandt County:** Delta Drilling Company-Beckett & Torrans' Smith 1, S. L. Flowers Survey, 2½ miles northwest of Grand Saline, was drilling at 5115 feet in Woodbine, topped at 4514 feet with elevation of 419 feet. Roval Petroleum Corporation's Key 1, 2½ miles southeast of Wills Point, entered massive anhydrite at 6740 feet, and was drilling shaley-lime 6770 feet.

## Southwest Texas

### Wildcat Work Active; More Tests in Prospect

More wildcats are drilling now in Southwest Texas than at any period within the past four months while numerous other tests are being planned for immediate drilling. This spurt in developments is due mainly to the opening of a new trend, particularly in the Karnes-Bee County area. Activity in this and adjacent areas would step up considerably more, producers report, if there were an adjustment in crude prices. In many cases new development is held to a minimum and many new wells are being projected only to protect leases.

By far the most interesting area from an exploration and drilling standpoint, is in Karnes County where Eocene sands are paying off. The more recent development is Seaboard Oil Company's strike in the Hobson area. The company's Pluezkhan 1 is the second well in the field and is 2000 feet southwest of the discovery producer. On a drill-stem test this well recovered 2100 feet of oil and 30 feet of water in 15 minutes with a bottom-hole pressure of 1750 pounds. Pay sand was topped at 4010 feet but the hole was drilled to 4040 feet. Operators are now making a production test after setting 5½-inch casing.

Plymouth Oil Company is preparing to drill Bridges 1 in Ripley survey in north portion of county. Humble Oil & Refining Company also is preparing to drill a wildcat on its block three miles northeast of the Plymouth well in the D. D. McConnell survey. Phillips Petroleum Company is spudding its second well in the Hondo Creek field, 3 miles southeast of Kenedy, ¼ mile south of the discovery. Transwestern Oil Company has been coring in Wilcox around 7400 feet in Sellers 1, wildcat 7 miles southeast of Runge. The well already has shown for a producer in the Pettus section, although the first test in the Wilcox at 7220-26 feet showed salt water.

**Duval County:** George W. Strake is completing the second well in recently discovered Strake field. Yates Ranch 2 is much better than the discovery although it ran lower structurally. Perforated at 3179-92 feet in Government Wells sand, was 300 barrels daily through ¼-inch choke and 179 barrels daily on 3/16-inch choke, gas-oil ratio 1300-1 on first test and 2000-1 on second choke. Tubing pressure was 750 pounds, casing 1000 pounds. Sand was logged at 3172-97 feet in drilling to 3805 feet where salt water was found in Pettus. It is 1120 feet southeast of the discovery. This area has earmarks of becoming a large field.

## Texas Gulf Coast

### Hitchcock, Galveston County Field Gets Extension

Maco Stewart is completing a potential gauge on Stewart 1, ½ mile east of production at Hitchcock, Galveston County. Casing was perforated at 5132-43 feet with 40 shots and flowed from 20 to 22 barrels of oil hourly through ¼-inch choke with 610 pounds pressure on tubing, casing sealed. Operators found 25 feet of prolific Miocene sand. The well was originally drilled by Glenn H. McCarthy to 7781 feet, but drilling ceased when shale was reached, Stewart reserving all mineral rights above 7500 feet. An unsual feature of the new production is that a dry hole is between the well and the regular field. Although there is a pronounced fault between the two areas, the new well found the Miocene top about flat with the field wells. Stewart owns 2841 acres in fee, so drilling is due to be on a slow scale since there is no offset acreage to the well.

**Colorado County:** Magnolia Petroleum Company is drilling below 7500 feet in Anderson 1, wildcat 2 miles southwest of Chesterville, after finding three sands in the Cockfield indicating gas-distillate production. Two of the sands were tested, at 8482-85 feet and

6856-60 feet. The third level was not tested. This well, projected to the Wilcox, is in GH&H 15.

**Waller County:** Humble Oil & Refining Company is making a new test on Hebert 1, wildcat north of Katy field. Perforations have been made at 6866-68 feet after drilling out cement to 6870 feet. This well has been tested at several levels, none indicating prolific oil production.

## Louisiana Gulf Coast

### St. James Discovery Believed of Importance

By far the most interesting development in the coastal belt this year is a gas-condensate discovery in the St. James area of St. James Parish which has indications of becoming a large field. The discovery was drilled by Humble Oil & Refining Company on a block of approximately 10,000 acres, thus pointing the way to further exploration in the parish. Although the parish has small production at Hester (Convent) and La Pice, Humble's strike in some respects is regarded as the first field of any importance.

Another coast development is the indicated opening of first Wilcox production at Pine Prairie in Evangeline Parish where the field already produces from the Cockfield and the Sparta.

**St. James Parish:** Humble Oil & Refining Company has completed a gauge on Panno & Bossetta 1, discovery of the St. James gas-condensate field in Section 8-12s-16e. The well, which found production in the basal Miocene, was perforated at 10,764-82 feet and flowed 90 barrels of condensate and 2,200,000 cubic feet of gas daily through ⅛-inch choke with 3600 pounds pressure on tubing, casing sealed. Total depth is 10,895 feet with 5½-inch casing set for completion.

Humble has done considerable geophysical work in the area and controls most of the acreage, although Cities Service Oil Company and Skelly Oil Company own a few scattered tracts. Cities Service drilled a wildcat in the area months ago, although it was 2½ miles from the Humble discovery. The structure is believed to be a faulted deep-seated non-piercement type dome. Humble already has staked a second location, Graugnard & Sons 1, Section 85-12s-16e, 2150 feet northwest of the discovery and on banks of Mississippi River.

**Evangeline Parish:** Roy Lee, Trustee, is reported to have found sufficient sands in the Wilcox to make a producer from this formation in a well on west flank of Pine Prairie dome. The well is Crowell-Spencer 1, Section 35-3s-1w, and if productive will be the first time the Wilcox has produced at Pine Prairie although the Cockfield produces from one horizon and the Sparta produces from two levels. The Sparta was topped at 9358 feet and found shows in that horizon at 9362-68 feet and 9440-50 feet. The operator has been coring below 10,550 feet in the Wilcox and details have not been released. The same operator is making a flow test in Crowell-Spencer 2, Section 2-4s-1w, on the southeast side of the dome, with 5½-inch casing set on bottom at 8448 feet.

Continental Oil Company has extended production several locations westward at Ville Platte in Evangeline Parish. Vidrine-Reed-Vidrine 1, Unit 40, was perforated at 10,148-70 feet and flowed 265 barrels of 39.4-gravity oil daily through 10/64-inch choke with 2400 pounds pressure on casing and 1200 pounds on tubing.

## North Louisiana

### Catahoula Lake Well Flows 152 Barrels on Test

Carter Oil Company and Phillips Petroleum Company's Catahoula Lake C-3, SE SW 6-6n-4e, LaSalle Parish, southwest edge Wilcox producer at Catahoula Lake, flowed 152.28 barrels of 43-gravity oil on 24-hour gauge, using 3/16-inch choke. Packer was set at 4052 feet and 24 perforations made in C-2 sand at 4083-89 feet. Drilling stopped at 4400 feet.

The trend at Catahoula Lake, a 1942 discovery, is southwest-northeast. Three wells are on production and the structure appears to terrace. A half-mile north of the discovery, Catahoula Lake A-1, SW NW 5-6n-4e, Carter Oil Company and Phillips Petroleum Company are drilling a fourth test, Catahoula Lake A-2, SW SW 32-7n-4e.

**Tensas Parish:** Carter Oil Company and The California Company's Rhodes 2, NW 28-9n-10e, topped Wilcox at 3370 feet and logged oil show at 3631-42 feet, and was drilling hard shale at 4975 feet. Location is two miles northwest of Lake St. John production.

**Claiborne Parish:** At Athens, Skelly Oil Company and Sunray Oil Company's Wallace-Griffis 1, SE NE 36-20n-7w, topped Travis Peak at 6035 feet,


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Shreveport, Louisiana, U. S. A.

*For Export:* ACME WELL SUPPLY COMPANY, 19 RECTOR STREET, NEW YORK, NEW YORK

and drilled to 6605 feet. On 16-hour test, with 3/16-inch choke, flow was established at 4,000,000 cubic feet of wet gas, 2200 pounds tubing pressure, which was shut in pending official gauge.

Union Producing Company's King Unit A-1, NE 8-21n-4w, at North Lisbon, bottomed in Smackover Lime at 11,103 feet, is plugged back to 7905 feet with tubing at 7824 feet, to test in Cotton Valley at 7790-7816 feet.

## Arkansas

### Miller County Wildcat Deepening From Smackover

Barnsdall Oil Company et al quit Grace 1, SE NW 4-15s-27w, Miller County, after deepening hole to 6695 feet and testing mostly salt water from Smackover lime at 6215-25 feet. Cotton Valley was established at 5040-60 feet, with no showing, and Buckner was drilled through at 5975 feet. Smackover lime was topped at 6183 feet.

Magnolia Petroleum Company et al's Grace 1, wildcat at Garland, NE NE 4-16s-26w, which had expected Smackover lime at approximately 7600 feet, was drilling shale and anhydrite in Buckner at 7739 feet.

**Calhoun County:** Placid Oil Company which had abandoned Freeman-Smith 4, wildcat NE NW 2-15s-14w, at 4423 feet, was attempting to recomplete this test, swabbing approximately 5 barrels per hour from upper Cretaceous. This well is 7 miles northeast of the old Smackover field.

## California

### Wilmington Tax Zone Gets Belated Attention

In reverse of a trend in recent years toward deep-zone exploration, California operators are giving shallow prospects a new going over; and in some instances they are obtaining bonanza returns.

Most outstanding example in this campaign was a test of Tar zone potentialities of the Wilmington field. From 2232 feet, Long Beach Oil Development Company completed a flow of 350 barrels of 15.2-gravity clean oil. This location, being right on top of the structure, may represent maximum possibilities of the zone but at the same time it is conceded to have proved up a very considerable area for highly profitable production from this zone. Long Beach Oil Development Company immediately launched a development program restricted to the Tar zone; and expects to drill 10 wells in short order. Meanwhile holders of adjacent properties also are getting under way, and it is hoped the new development will result in a quick addition of substantial proportions to the daily heavy-oil capacity of the field.

The Tar zone, being the top and least important of the five zones in this field, has been passed up to get production from the Upper and Lower Terminal zones below. Wilmington was an overproduction problem almost from its inception and inasmuch as low-gravity oil then was a drug on the market, operators by common consent restricted development to only the Ranger and Terminal zones — often to the Terminals alone. But until the test mentioned here was made few, if any, realized that the Tar zone was capable of such prolific production. Recovery possibilities up structure now are indicated as about 350 barrels per acre-foot.

## Michigan

### Newaygo Test Has Traverse Show; Going to Dundee

Ohio Oil Company's Vaughan 1, S½ NE NE 29-15n-11w, Newaygo County, drilled Traverse lime section at 2798 feet and showed 3 feet of saturated lime at 2805 feet, yielding 1300 feet of oil and 500 feet of water in 9 hours on test, and during drilling operations has been flowing an average of 22 barrels of oil every 24 hours. Hole will be carried to Dundee section before any production test with casing is made on Traverse. Previously this wildcat had shown gas in Stray sand on drill-stem test at 1158-1219 feet.

**Osceola County:** C. L. Maguire, Inc.'s State A1, S½ NE NE 34-18n-9w, a mile southeast of discovery well of Cedar field, logged Dundee at 3886 feet, better than 40 feet low, and abandoned at 3908 feet.

Sun Oil Company drilled Snyder-Gruber 1, N½ SW SW, 27-18n-8w, dry in Dundee at 3772 feet and abandoned the west offset, Weatherby-Gruber 1, N½ SE SE 28-18n-8w, at 3190 feet after logging Traverse structurally low. These two abandonments appear to cut off extension on the southwest flank of Evart field.

**Ogemaw County:** Alvin H. Weber has farmed out a block of several hundred acres centering in Foster Township, Ogemaw County, to Muskegon Development Company, with the latter prepared for a five-well campaign. Weber drilled the discovery well on this block last January, a Monroe lime producer rated at 22 barrels per day from 4287 feet.

**State Leases:** Operators paid bonuses of $39,778 for 32,866 acres of state land at April 9 state lease auction for an average of $1.21 per acre, all wildcat. Top price was $42.18 an acre for a 72-acre lease, N½ NW 7-20n-5w, Clare County. The sale boosted Michigan's state leases to 510,000 acres.

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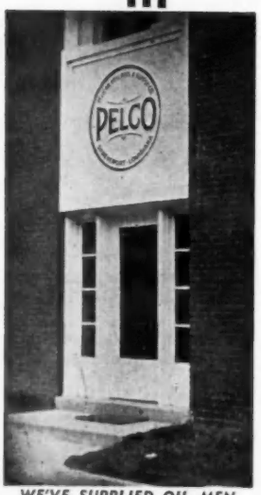
**FRANK S. O'NEIL** has been promoted to vice president of Link-Belt Company, Indianapolis. He joined the organization at the Pershing Road plant in Chicago, where he worked in the foundry, machine shop, cost department, and rate setting and production department. In 1916 he was transferred from Chicago to Indianapolis and has successively served as assistant superintendent in charge of malleable iron chain assembly, superintendent of the Ewart plant, assistant general manager of both Ewart and Dodge plants, and as general manager since 1939. He succeeds James S. Watson, who is retiring after 50 years of service. Watson will continue a director.

**B. F. COOMBS** has been appointed representative for Greene, Tweed & Company, for Eastern Texas and Western Louisiana, with headquarters at Box 495, Route 12, Houston, Texas.


**Astigmatism In Business**

The lenses in human eyes are distorted with self-interest and prejudice. Recognizing this astigmatism in ourselves we have, for 35 years, tried to stand in the other fellow's shoes, seeing his viewpoint and cultivating tolerance. What we think is not too important, even when asked. And when we are asked, we try to remember that advice is cheap and fallible. The result has been that many men prospecting for supplies and equipment TRY PELCO FIRST. They get more service and less static.




WE'VE SUPPLIED OIL MEN IN OUR AREA FOR 35 YEARS

**PELICAN WELL TOOL & SUPPLY CO.**

SHREVEPORT LOUISIANA

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Lake Charles

# United States Well Completions

### ARKANSAS

**Columbia County—Stephens-Smart:** R. H. Crow, Tr.'s Guttrey 1-A, sw ne ne 11-15s-20w, pump 200 bbls; elev 229 ft, Tokio 2462-74 ft, 5½-in 2536 ft, td 2550 ft.

R. H. Crow, Tr.'s Hall B-1, sw sw nw 11-15s-20w, elev 273 ft, Tokio 2468-73 ft, td 2641 ft, no gauge.

R. H. Crow, Tr.'s Smart F-1, sw nw sw 12-15s-20w, elev 221 ft, perf Travis Peak 3354-3400 ft, td 3887 ft, no gauge.

Lion's Stocks 1, se se 10-15s-20w, pump 200 bbls, Tokio 2537-41 ft, td 2572 ft.

Grady Vaughn's Taylor 1, se nw 12-15s-20w, pump 200 bbls, Travis Peak, td 4100 ft.

T. W. Lee's Grayson 1, ne se 10-15s-20w, abnd 2632 ft.

**Lafayette County—Midway:** Arkansas Fuel Oil Co.'s Creek 2, se ne 9-15s-24w, flow 13 bbls hr, ¼-in, tp 110, cp 410 lbs, perf 6430-58 ft, td 6479 ft.

**Union County — New London:** Marine Oil Co.'s King 1, se nw 8-18s-11w, flow 85 bbls 12 hrs, ¼-in, 7-in 5569 ft, td 5812 ft.

### ARKANSAS WILDCATS

**Calhoun County—Discovery:** Placid Oil Co.'s Freeman-Smith 4, ne nw 2-15s-14w, swab 5 bbls hr, Upper Cretaceous 4423 ft.

**Miller County — Failure:** Barnsdall et al's Grace 1, se nw 4-15s-27w, abnd 6695 ft.

**Union County—Discovery:** Sam Richardson's Moody 1, sw nw 16-s-14w, flow 240 bbls, ¼-in, perf Travis Peak 3241-47 ft, td 3518 ft.

### CALIFORNIA

**Fresno County—Coalinga Old Field:** Shell's 167-26, ne sw se 12-19-15, pump 258 bbls, perf 3308-3230, 3135-2980 ft, black shale 2958 ft, Kreyenhagen 3295 ft, td 3310 ft.

Standard's 32-35A, nw ne ne 35-19-15, pump 63 bbls 20.8 gr, 7-in 3357 ft, td 3490 ft, pd 3362 ft.

Standard's 58-35A, sw ne se 35-19-15, pump 67 bbls 20.6-gr, 112 ft perf 3307 ft, td 3330 ft.

Standard's 60-35A, nw ne se 35-19-15, pump 36 bbls 20.8-gr, 123 ft perf 3403 ft, td 3405 ft.

Texas Co.'s C-6, se ne ne 6-20-15, pump 24 bbls 17-gr oil, 12 water, 61 ft perf 2332 ft, td 2332 ft.

**Kern County—Belridge South:** Belridge Oil Co.'s 36-34, sw nw sw 24-28-21, pump 20 bbls 14.1-gr, 8⅝-in 775 ft, td 775 ft.

Belridge Oil Co.'s 46-34, se ne sw 34-28-21, pump 26 bbls 13.1-gr, 8⅝-in 788 ft, td 791 ft.

General's Belridge 27-2, ne se nw 2-29-21, pump 50 bbls 16-gr oil, 10 bbls water, perf 852-666, 686-706, 730-785 ft, td 996 ft, pd 790 ft.

General's Belridge 28-2, ne se nw 12-29-21, pump 54 bbls 15.1-gr oil, 36 water, 166 ft perf 1042 ft, td 1042 ft.

Ohio's Hopkins Fee 17, nw se ne 4-29-21, pump 7 bbls 13.9-gr oil, 18 bbls water, 104 ft perf 782 ft, oil sand 678 ft, td 783 ft.

**Kern County—Buena Vista Hills:** Standard's 79-11D, nw se sw 11-32-24, pump 25 bbls, 6⅝-in 2523 ft, Scalez 2463 ft, td 2525 ft.

Standard's 104-7D, se sw ne 7-32-24, pump 49 bbls, 5½-in 3126 ft, Wilhelm zone 3105 ft, td 3128 ft.

**Kern County—Kern Front:** General's Young 13, nw se nw 14-28-27, pump 50 bbls 14.4-gr oil, 10 bbls water, 87 ft perf 2076 ft, td 2076 ft.

**Kern County—Lost Hills:** Universal Consolidated's 53, sw ne nw 32-26-21, pump 10 bbls 16-gr oil, 5 water, 599 ft perf 1725 ft, td 1726 ft.

**Kern County — Midway-Sunset:** Chanslor Canfield Midway Oil Co.'s 25-25, se sw nw 25-31-22, pump 25 bbls 18.9-gr oil, 5 water, 270 ft perf 2300 ft, td 2350 ft.

C. C. M. O. Co.'s 90-8, se ne se 8-32-23, pump 25 bbls 13-gr oil, 3 water, perf 1005-1095, 1220-1380 ft, td 1460 ft.

R. S. Miesse's Holloday 1, nw nw sw 15-32-23, pump 35 bbls 14.3-gr oil, 4 water, perf 1495-1503, 1535-1550, 1760-1765 ft, td 1968 ft.

Richfield's Fairfield 7, sw ne ne 11-31-23, pump 22 bbls 15.7-gr oil, 2 water, 75 ft perf 1258 ft, td 1345 ft, pd 1260 ft.

**Kern County—Mount Poso:** C. C. M. O. Co.'s Mon 21, se se nw 26-27-28, pump 5 bbls 14.8-gr oil, 3 water 45 ft perf 1445 ft, td 1463 ft, pd 1445 ft.

Shell's Vedder-Rall 25, ne nw sw 9-27-28, pump 89 bbls 15-gr oil, 37 water, 45 ft perf 2030 ft, Vedder 1992 ft, td 2030 ft.

**Kern County—Poso Creek-Premier:** Standard's 5-20, sw se se 5-28-27, pump 7 bbls oil, 13 water, 6⅝-in 2819 ft, td 2820 ft.

Westates Pet. Co.'s Cauley 45, se sw sw 16-28-27, pump 108 bbls 14.8-gr oil, 12 water, 8⅝-in 2923 ft, td 2925 ft.

**Los Angeles County — Wilmington:** Long Beach Oil Development Co.'s "W" 49, 449 ft nely nl Seaside Blvd fr e side 27th Ave thence 1598 ft sely at r/a, flow, no est, perf 2731-2898, 2944-2987 ft, td 2992 ft.

**Madera County—Mendota (Gas Discovery):** Texas Co.'s Gill 38-16, sw se sw 16-31-16, 11,000,000 gas, 43/64-in 1725-1825 lbs, perf 4415-4425, 4445-4465, 4470-4480 ft, Kreyenhagen est 4210 ft, Eocene sand 4419 ft, Naoche sand 5630 ft, Diabase 9145 ft, td 9154 ft, pd 4485 ft.

**Sacramento County—Rio Vista:** Standard-Texas Co.'s Midland Fee 1-3, sw sw se 5-3-3, flow 17,793,000 gas, ¾-in, 1618/1475 lbs, 310 ft perf 4260 ft, green sand 3950 ft, white sand 4070 ft, td 4260 ft.

**Santa Barbara County—Los Olivos:** Tide Water Associated's Chamberlin 1, ne sw nw 33-8-31, pump 106 bbls 10-gr oil, 84 water, 741 ft perf 5189 ft, Sisquoc 1400 ft, td 5194 ft.

**San Joaquin County—Lodi (Gas Discovery):** Amerada - Bankline Oil Co. - Honolulu Oil Corp.'s Lodi Comm 9-1, nw nw se 9-4-7, 5,300,000 gas, ⅝-in, 623/911 lbs, perf 2240-2270 ft, td 4471 ft, pd 2270 ft.

**Ventura County—Rincon:** C. C. M. O. Co.'s B-45, ne ne ne 17-3-24, pump 12 bbls 30-gr oil, 7 water, perf 3390-3370 ft, td 4987 ft, pd 4170 ft.

### CALIFORNIA WILDCATS

**Fresno County — Failure:** Amerada's Sonnichson 53-2, 2-17-17, try for extension Helm field, abnd 8202 ft.

**Kern County—Failure:** Petromont Oil Co.'s Petromont - Belridge 1, 25-28-20, Belridge South area, abnd 1518 ft.

**Kern County—Failure:** Texas Co.'s P.U.P. 2-33-11-23, deep zone try southeast Midway area, abnd 10,607 ft.

**Los Angeles County—Failure:** Potrero Oil Co.'s Newman 1, 32-1-11, Rio Hondo area, abnd 7111 ft.

### ILLINOIS

**Clay County:** National Ref. Co.'s Thing 1, w½ nw nw 24-3n-6e, McCl 2980-90 ft, 36 bbls, 2992 ft.

E. B. Gill's Kech 1, c se nw ne 35-4n-7e, TS sd 2315-30 ft, 150 bbls, 2330 ft.

Central PL Co.'s Reed Heirs 3, c se nw nw 14-5n-5e, Weiler 2136-48 ft, 75 bbls, 2148 ft.

Tide Water's Davis 7, c sw se ne 15-5n-5e, Ben 2281-2307 ft, 107 bbls, 2350 ft.

Texas Co.'s Bloemker-Webster 1, nw nw sw 3-5n-7e, Weiler 2486-96 ft, 94 bbls, 2534 ft.

**Effingham County:** Katherine Benson's Wright 1, sw nw se 27-6n-5e, Ben 2289-98 ft, Aux V 2355-65 ft, 80 bbls, 2365 ft.

**Fayette County:** Carter's Smith 3, nw se ne 20-8n-3e, Weiler 1510-31 ft, 89 bbls, 1595 ft.

Carter's Durbin 28-4, c ne ne 28-8n-3e, gas input, 1535 ft.

**Hamilton County:** Gulf's Sneed 2, c nw ne 20-4s-7e, Aux V 3253-82 ft, 1225 bbls, 3427 ft.

Oil Carriers' Warren 1, c ne se se 23-6s-5e, Aux V 3097-3118 ft, 281 bbls, 3120 ft.

Texas Co.'s Henderson-Johnson 2, c se sw se 11-6s-6e, Aux V 3076-3108 ft, 52 bbls, 3108 ft.

Perrine and Pearson's Lee 2, c se nw nw 27-6s-6e, Aux V 3089-3106 ft, 255 bbls, 3106 ft.

Texas Co.'s Hall 4, c se sw nw 27-6s-6e, Aux V 3082-3109 ft, 112 bbls, 3310 ft.

Texas Co.'s Wilson 3, c se sw sw 27-6s-6e, Aux V 3100-18 ft, 87 bbls, 3118 ft.

Kingwood Oil Co.'s Dodd 9, c nw ne nw 6-6s-7e, abnd 3054 ft.

**Jasper County:** Pure's Resch 2, c nw ne 20-6n-10e, abnd 2855 ft.

**Lawrence County:** Olin et al's Scott & Guy 6, ne se sw 18-4n-10w, 7 million gas, 805 ft.

**Marion County:** Texas Co.'s Blenz 2, c nw nw se 16-1n-2e, Ben 1912-22 ft, 26 bbls, 1923 ft.

**Richland County:** Pure's Coen 37, cnl 9-3n-9e ,Weiler 2586-97 ft, 114 bbls, 2650 ft.

**Wayne County:** Pure's Riggs Cons 2, c nw ne sw 2-1n-7e, Aux V 2936-60 ft, 116 bbls, 3072 ft.

Pure's Brinker "A" 1, c se nw 14-1n-8e, McCl 3075-87 ft, 156 bbls, 3090 ft.

Pure's Flexter 2, c se nw se 35-2n-7e, Aux V 2930-47 ft, 216 bbls, 2950 ft.

W. C. McBride's Newton 1, c nw ne ne 30-1s-5e, abnd 3010 ft.

Texas Co.'s Murphy-Draper 1, c n½ nw ne 8-3s-6e, abnd 3438 ft.

**White County:** Mabee O&G Co.'s Smith 12, ne sw sw 4-4s-14w, 2801-24 ft, 32 bbls, 2829 ft.

Cal Star Pet. Co.'s Miller-Ford 38-C, c sw nw sw 22-4s-14w, Aux V 2836-55 ft, 45 bbls, 2840 ft.

Sun's Hoosier-Spencer 7, c ne ne nw 6-5s-11e, Tar Spgs 2318-56 ft, 250 bbls, 2356 ft.

Carter's Phillips 1, c nw ne ne 19-6s-9e, Cyp 2643-60 ft, Ben 2782-2810 ft, 167 bbls, 2932 ft.

### ILLINOIS WELLS DEEPENED

**St. Clair County:** Thompson et al's Nolte 1, c s½ sw se 27-1n-10w, otd 447 ft, abnd 866 ft.

### ILLINOIS WILDCATS

**Fayette County—Failure:** King's Gren 1, c nw nw ne 31-8n-1w, abnd 810 ft.

**Hamilton County—Failure:** Texas Co.'s J. Mann 1, c se nw ne 21-6s-6e, abnd 3375 ft.

**Richland County—Failure:** J. Hassler et al's Bunn Community 1, c e½ se nw 33-3n-14w, abnd 3182 ft.

**St. Clair County—Failure:** Eason Oil Co.'s Thomas 1, c ne ne nw 4-1s-8w, abnd 2174 ft.

J. Vetsch et al's Lange 1, c se se nw 24-2s-6w, abnd 2745 ft.

**Wayne County—Failure:** Lambert & Peek's

## Wells Completed in the United States in Week Ended April 17, 1943

**Data preliminary and subject to revision. Revised and more complete data on all completions shown in monthly summary of drilling, published in second issue of each month. More detailed data on wildcats published in third issue of each month.**

| State or District | FIELD COMPLETIONS: New Wells *Oil | Gas | †Input | Dry | Total | Old Wells Deepened | WILDCAT COMPLETIONS *Oil | Gas | Dry | Total | ALL COMPLETIONS This Week | Last Week | Cumulative This Year | Cumulative Last Year |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Alabama | | | | | | | | | | | | | | 3 |
| Arkansas | 6 | | | 2 | 8 | | 2 | | 1 | 3 | 11 | 5 | 55 | 66 |
| California | 25 | 1 | | | 26 | | | 2 | 4 | 6 | 32 | 28 | 405 | 256 |
| Colorado | | | | | | | | | | | | 1 | 6 | 4 |
| Georgia | | | | | | | | | | | | | | 1 |
| Illinois | 22 | 1 | 1 | 4 | 28 | 1 | | | 8 | 8 | 37 | 41 | 579 | 560 |
| Indiana | 1 | 1 | | 1 | 3 | | | | 1 | 1 | 4 | 2 | 86 | 115 |
| Kansas | 15 | 1 | | 11 | 27 | | 1 | | 9 | 10 | 37 | 32 | 443 | 495 |
| Kentucky | 1 | 1 | | | 2 | | | | | | 2 | 1 | 78 | 48 |
| Louisiana | 8 | | | 3 | 11 | | 1 | 1 | 3 | 5 | 16 | 10 | 161 | 327 |
| North Louisiana | 5 | | | 2 | 7 | | | 1 | 3 | 4 | 11 | 5 | 68 | |
| South Louisiana | 3 | | | 1 | 4 | | 1 | | | 1 | 5 | 5 | 93 | |
| Michigan | 2 | | | 3 | 5 | 1 | | | 6 | 6 | 12 | 13 | 139 | 204 |
| Mississippi | | | | | | | | | | | | 2 | 8 | 51 |
| Missouri | | | | | | | | | | | | | 3 | 9 |
| Montana | | | | | | | | | | | | 2 | 58 | 46 |
| Nebraska | | | | | | | | | | | | | | 16 |
| New Mexico | 2 | 1 | | | 3 | | 1 | | | 1 | 4 | 7 | 79 | 125 |
| New York | 12 | | 8 | | 20 | | | | | | 20 | 20 | 336 | 368 |
| Ohio | 3 | 9 | | 5 | 17 | | | | | | 17 | 14 | 261 | 366 |
| Oklahoma | 17 | 2 | 2 | 3 | 24 | 1 | 1 | | 2 | 3 | 28 | 30 | 414 | 527 |
| Pennsylvania | 38 | 3 | | 1 | 42 | | | | | | 42 | 41 | 743 | 1,073 |
| Tennessee | | | | | | | | | | | | | 1 | 3 |
| Texas | 41 | 2 | | 12 | 55 | 3 | 4 | | 20 | 24 | 82 | 82 | 1,113 | 2,232 |
| E.T. Border Co.'s | | | | | | | | | 1 | 1 | 1 | | 6 | |
| East Texas Field | | | | | | | | | | | | | 2 | |
| Rest of E. Texas | 1 | | | 1 | 2 | | | | 2 | 2 | 4 | 7 | 62 | |
| North Texas | 7 | | | 3 | 10 | 1 | | | 9 | 9 | 20 | 20 | 260 | |
| West Central | 2 | | | 4 | 6 | 1 | | | 1 | 1 | 8 | 7 | 93 | |
| West Texas | 20 | | | | 20 | 1 | | | | | 21 | 22 | 260 | |
| Tex. Panhandle | 2 | 1 | | | 3 | | | | | | 3 | 4 | 70 | |
| Upper Coast | 1 | | | | 1 | | | | 1 | 1 | 2 | 5 | 71 | |
| Lower Coast | 7 | 1 | | 3 | 11 | | 2 | | 1 | 3 | 14 | 16 | 161 | |
| Southwest Texas | 1 | | | | 1 | | 2 | | 2 | 4 | 5 | 1 | 103 | |
| South Central | | | | 1 | 1 | | | | 3 | 3 | 4 | | 24 | |
| West Virginia | 2 | 8 | | 1 | 11 | 1 | | | | | 12 | 14 | 183 | 219 |
| Wyoming | | | | | | | | | | | | 5 | 40 | 29 |
| Total U. S. | 195 | 30 | 11 | 46 | 282 | 7 | 10 | 3 | 54 | 67 | 356 | 350 | 5,191 | 7,143 |

* Includes distillate wells. † Includes salt water disposal wells.

Daubs 1, c sw nw 15-1n-9e, abnd 3410 ft.

**White County—Failure:** B. M. Heath's Miller 1, c se ne sw 26-4s-9e, abnd 3359 ft.

N. V. Duncan Inc.'s Stokes 1, c se ne se 27-4s-10e, abnd 3212 ft.

### INDIANA

**Daviess County:** Cannon & Hart's Graves 3, ne ne ne 8-2n-5w, abnd 640 ft.

**Posey County:** J. F. Freuil et al's Seifert 4, s½ ne nw 30-6s-12w, 25,000 gas, 297 ft.

**Vanderburg County:** Superior's Nurrenburn 4, se nw sw 32-6s-11w, Walts 1749-55 ft, 40 bbls, 1755 ft.

### INDIANA WILDCATS

**Warrick County—Failure:** Chenault et al's Roscoe Turner 1, w½ sw se 36-6s-9w, abnd 2132 ft.

### KANSAS

**Barton County — NW Beaver:** Appleman's Couchman 1, c ne nw 7-16s-12w, Arb 3348 ft, abnd 3350 ft.

**Barton County — Lanterman:** Three Way Drlg. Co.'s Isern 1, c n½ ne sw 22-19s-11w, Arb 3348 ft, pump 50 bbls, 3366 ft.

**Butler County—Eldorado:** Molk Pet. Co.'s Mills 2-A, ne se nw 27-25s-5e, Viola 2473 ft, pb to 2496 ft, 1000 gal acid, pump 15 bbls oil plus salt wtr, 2513 ft.

**Ellis County—Ellis:** Darby's Bittel 1, c w½ se sw 31-12s-20w, Arb 3829 ft, 5000 gal acid, pump 717 bbls, 3845 ft.

**Kearny County—Hugoton:** Fin - Kerr O&G Co.'s Hamlin 3, c 25-24s-35w, Ft. Riley, 7-in 2462 ft, 22,000 gal acid, 12,700,000 gas, 2698 ft.

**Leavenworth County—McLouth:** Magnolia's Bell 3, c se sw 6-10s-21e, Miss 1418 ft, shot 70 qts 1406-1421 ft, pump 20 bbls, 1433 ft.

**Marion County — Hillsboro:** National Pet. Co.'s Ewert 1, nw nw nw 18-19s-3e, Viola 2862 ft, 1000 gal acid, abnd 2871 ft.

**McPherson County—Henne:** H&M Drlg. Co.'s Anderson 1, c s½ ne se 21-17s-1w, Miss 2690 ft, abnd 2696 ft.

**McPherson County — Lindsborg:** Carter's Rundbeck 2, c w½ sw sw 5-17s-3w, Viola 3349 ft, 2500 gal acid, pump 171 bbls oil, 27 wtr, 3355 ft.

**McPherson County—SW Lindsborg:** Auto Ordnance's Bengstrom 6, c w½ ne ne 25-17s-4w, Viola 3374 ft, 300 gal acid, pump 308 bbls, 3385½ ft.

**Pratt County—Carmi:** Champlin's Atrueder 1, sw e sw 29-26s-12w, Arb 4270 ft, 9000 gal acid, potential 3000 bbls, 4297 ft.

Shell's Miskeman 1, sw nw ne 32-26s-12w, Arb 4274 ft, 2500 gals acid, potential 3000 bbls, 4320 ft.

**Reno County—Peace Creek:** Cities Service's Long A-2, ne se sw 14-23s-10w, Viola 3795 ft, abnd 3812 ft.

**Reno County—Zenith:** Magnolia's Darr 4, c ne nw 6-24s-10w, Viola 3695 ft, 2000 gals acid, potential 3000 bbls, 3696 ft.

**Rice County—Silica:** Herndon Drlg. Co.'s Bernstorg 1, c n½ nw se 19-19s-10w, Arb 3348 ft, abnd 3378 ft.

Phillips' Minor 5, c se se 35-19s-10w, Arb 3280½ ft, 500 gals acid, potential 2442 bbls, 3284 ft.

W. C. Emrick's Binger 1, ne nw nw 2-20s-10w, Arb 3304 ft, abnd 3318 ft.

**Rice County—Keesling:** Cities Service's Abbot 1, c ne sw 16-20s-9w, Arb 3295 ft, abnd 3321 ft.

**Rooks County—Barry:** Continental's Gick 1, ne sw sw 1-9s-19w, abnd 250 ft.

**Russell County—Hall-Gurney:** Jones & Shelborne's Hupfer 1, nw nw nw 31-14s-12w, Arb 3162 ft, abnd 3175 ft.

**Russell County—NW Greenvale:** Cities Service's Steinlie 1, c s½ sw nw 32-14s-12w, Arb 3176 ft, pump 213 bbls, 3177 ft.

**Russell County—Witt:** National Rfg. Co.'s Boxberger 2, sw sw sw 3-14s-14w, Lans 2972 ft, 10,000 gals acid, pump 480 bbls, 3011 ft.

**Russell County—W. Trapp:** Pryor & Lockhart et al's Boxberger B-2, c s½ ne se 10-15s-14w, Lans 2981 ft, Arb 3233 ft, 500 gal acid, pump 542 bbls, 3235 ft.

**Stafford County—Drach:** Atlantic's Alpers 3, c se se 7-22s-12w, Arb 3672 ft, 940 bbls, 3678 ft.

**Stafford County—Ahnert:** Stanolind's Ahnert 2, c n½ nw se 26-22s-13w, Arb 3760 ft, abnd 3852 ft.

**Stafford County—Zenith:** Great Lakes Carbon's Buckle 2, c e½ sw nw 3-24s-11w, Viola 3696 ft, 3000 gal acid, pump and flow 401 bbls, 3714½ ft.

Sinclair Prairie's Buckle 1, c e½ ne nw 3-24s-11w, Arb 3836 ft, abnd 3841 ft.

### KANSAS WILDCATS

**Barton County—Failure:** Appleman's McFarland 1, c s ½ne se 1-16s-11w, Lans 3013 ft, Arb 3335 ft, abnd 3364 ft.

**Cowley County—Failure:** Nadel & Gussman's Mohlar 1, c s½ se se 27-31s-4e, Bart 2962 ft, Miss 3055 ft, abnd 3068 ft.

**Dickinson County—Failure:** Adair-Morton & Philhan's Eggleston 1, se nw sw 31-16s-1e, Miss chat 2706 ft, abnd 3719 ft.

**Phillips County—Failure:** Northern Ordnance's Rowland 1, c se nw 27-3s-17w, Anhy 1369 ft, Wreford 2350 ft, Topeka 2860 ft, Lans 3095 ft, Mar 3371 ft, Scoy 3566 ft, Viola 3603 ft, Arb 3697 ft, abnd 3742 ft.

**Reno County — Failure:** Barnsdall's Morland 1, sw sw se 36-25s-5w, Lans 2790 ft, Miss 3568 ft, Kinderhook 3815 ft, Misener 3953 ft, Viola 4012 ft, abnd 4016 ft.

Superior of Calif.'s Reece 1, swc 2-26s-9w, Lans 3429 ft, Miss chat 3945 ft, Viola 4230 ft, Simp 4314 ft, Arb 4408 ft, abnd 4440 ft.

**Rush County—Failure:** J. J. Lynn et al's Weigand 1, c s½ ne sw 4-18s-16w, Anhy 1060 ft, Howard Ls 2955 ft, Topeka 2987 ft, Lans 3505 ft, Base KC 3792 ft, Cong 3889 ft, Arb 3905 ft, abnd 3955 ft.

**Russell County—New Field:** Alva Phillips' Krug 1-A, ne ne sw 8-14s-14w, Anhy 2498 ft, Topeka 2760 ft, Dodge 2990 ft, Dodge 3035 ft, Lans 3038 ft, pump 150 bbls, 3085 ft.

**Saline County — Failure:** Northern Ordnance's Warner 1, c se ne 10-15s-3w, Ft. Riley 480 ft, Flor Flint 570 ft, Wreford 660 ft, Topeka 1610 ft, KC 2116 ft, Miss 2746 ft, Kinderhook 3013 ft, Hunton 3155 ft, Viola 3293 ft, Arb 3510 ft, abnd 3583 ft.

**Sedgewick County—Failures:** Sam Springer's Sunnydale 1, c ne ne 22-25s-1e, abnd 2180 ft.

### KENTUCKY

**Daviess County:** J. C. Ellis' Mayfield 1, 2-N-31, 1,900,000 gas, 963 ft.

**Henderson County:** Carter's Denton 2, 21-O-3, Bethel 2370-85 ft, 65 bbls, 2385 ft.

### SOUTH LOUISIANA

**Beauregard Parish—Neale:** Gulf's Campbell 2, 2069 ft n alg el fr se cor 25, 594 ft w at ra in 25-3s-11w, 5½-in 11,216 ft, perf 11,180-84 ft, flow 246 bbls, 5/32-in, td 11,216 ft.

**Calcasieu Parish—Vinton:** Union's Gray 7-G, 830 ft s, 1652 w ne c 33-10s-12w, 5½-in 5815 ft, perf 5265-85 ft, flow 223 bbls, ¼-in, td 5830 ft.

**Evangeline Parish — Pine Prairie:** Gulf's Schlicher-Thomas 5-A, 1656 ft w, 387 s ne c 2-4s-1w, 5½-in 7696 ft, perf 7665-74 ft and 7682-86 ft, flow 292 bbls, 5/32-in, td 7697 ft.

**Terrebonne Parish—Deer Island:** Humble's Continental Land and Fur 3, 19-18s-13e, abnd 11,170 ft.

### SOUTH LOUISIANA WILDCATS

**Beauregard Parish—Oil Discovery:** General Crude's Baldwin 1, 990 ft fr w, 330 fr nl 27-6s-9w, Warreni 6650 ft, Jackson 7656 ft, Discorbis 8571 ft, Frio 6510 ft, 5½-in 6600 ft, perf 6512-20 ft, flow 151 bbls, ⅛-in, tp 1200, cp 1750, gor 834-1, gr 43.6, td 9412 ft. Opens Bear field.

### NORTH LOUISIANA

**Bossier Parish — North Carterville:** Hunt Oil Co.'s Nebo 3, ne sw 3-23n-12w, 91 bbls 38-gr, gas lift, perf 6116-38, 5000 gals acid, td 6202 ft.

Hunt's Oglee 1, ne ne 10-23n-12w, 149 bbls, 38-gr, gas lift, perf 6048-6140, 5000 gals acid, td 6200 ft.

**Claiborne Parish — Sugar Creek:** Carter's Coleman Unit 3, se se 30-20n-5w, abnd 6106 ft.

**Claiborne Parish — Haynesville:** Midstates' Lowe 1, ne se 5-23n-8w, flow 137.97 bbls, 14/64 in, perf 5393-5406, 5000 gals acid, td 5461 ft.

**LaSalle Parish — Nebo - Hemphill:** Hunt's Goodpine F-95, 39-7n-3e, perf 4156-60, flow 190 bbls, td 4221 ft.

**Winn Parish — Calvin:** Hunt's Goodpine F-25, ne sw 12-12n-5w, abnd 6207 ft.

### NORTH LOUISIANA WILDCATS

**Bienville Parish—Discovery:** Placid Oil Co.'s Nebo A-1, sw ne 11-15n-7w, 85,000,000 gas, spray dist, Pettit lime, td 7804 ft.

**Bossier Parish — Failure:** Hunt Oil Co.'s

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### ADVERTISING RATES

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**P. O. Box 2608 Houston, Texas**

Parde A-1, nw ne 18-23n-11w, abnd 6083 ft.
**Claiborne Parish—Failure:** Gulf's Miller 1, ne ne 14-20n-8w, abnd 10,761 ft.
**Concordia Parish—Failure:** Northern Ordnance's General American 1, se ne 9-7n-7e, abnd 6000 ft.

### MICHIGAN

**Missaukee County—Enterprise:** Sun's State A-2, s½ se ne 10-23n-5w, Dundee 3181 ft, abnd 3272 ft.
**Missaukee County—Norwich:** Sun's Horner 4, s½ se sw 11-24n-5w, Monroe lime, pump 29 bbls, 4475 ft.
**Osceola County—Evart:** Sun's Snyder-Gruber 1, n½ sw sw 27-18n-8w, abnd 3772 ft.
Sun's Weatherby 1, n½ se se 28-18n-8w, Traverse 3148 ft, abnd 3190 ft.
**Van Buren County—Geneva:** Socony Vacuum's Varnum 1, sw se sw 24-1s-16w, Traverse lime, flow 162 bbls, 1077 ft.

### MICHIGAN WELL DRILLED DEEPER

**Arenac County—Adams:** Ervin Major's Hull 1, c se nw 27-19n-3e, otd 3210 ft, pump 10 bbls, 4350 ft.

### MICHIGAN WILDCATS

**Barry County—Failures:** Sun's Mead 1, e½ ne se 8-3n-9w, Dundee 2143 ft, Monroe 2175 ft, abnd 2354 ft.
Southwest Development Co.'s Rankin 1, n½ nw se 19-1n-7w, Monroe 2031 ft, abnd 2176 ft.
**Ingham County—Failure:** Voorhees Drilling Co.'s Kirkpatrick 1, n½ sw sw 22-4n-1w, Dundee 2650 ft, abnd 2775 ft.
**Osceola County—Failure:** Sun's Rice 1, n½ nw ne 15-17n-8w, Dundee 3923 ft, abnd 3936 feet.
**Ottawa County — Failure:** Fisher-McCall's Brandt 1, c sw se 30-5n-13w, Traverse 1601 ft, abnd 1615 ft.

### MICHIGAN EXTENSION

**Osceola County—Cedar:** C. L. Maguire's State A-1, s½ ne ne 34-18n-9w, 1 mile southeast production, Dundee 3886 ft, abnd 3908 ft.

### NEW MEXICO

**Eddy County:** Grayburg Oil Co.'s Burch 8-B, c se ne 23-17s-29e, flow 600 bbls, 2-in, acid 6000 gals 2564-2686 ft, td 2904 ft.
**Lea County—Langlie:** Western Gas Co.'s Wimberly 1, c se nw 23-25s-37e, elev 3090 ft, lime 2280 ft, Yates 2380 ft, 2,500,000 sweet gas, 3255-3465 ft.
**Lea County—Rhodes:** Anderson-Prichard's State-Ohio 1-A-28, c se ne 28-26s-37e, flow 126 bbls 2-in, shot 65 qts 3278-3323 ft.

### NEW MEXICO EXTENSION

**Lea County — Eaves:** Continental et al's Eaves 1-B-31, 660 ft snl and 1980 ft wel 31-26s-37e, elev 2932 ft, base salt 2430 ft, 75 bbls oil, 32 water, gas lift, 3140-3248 ft. Extends production ¾ mi south.

### OKLAHOMA

**Carter County—Tussy:** L. Sikes' Adams 1, c nw nw 6-1s-3w, lime 3925-35, Tussy 3935-45, abnd 4322 ft.
**Commanche County—Ft. Sill:** Texas Co.'s M. Spencer 1, c nw nw 8-3n-10w, sand 790-812 ft, pb 820 ft, perf csg, flow 54 bbls, 14 hrs, 2-in, td 822 ft.
**Creek County—Unnamed:** Burk-Greis and Deep Rock's Gibson 1, ne ne nw 31-14n-7e, Prue 2845-76 ft, 4 million gas, 2914 ft.
**Creek County—Cushing:** Sinclair Prairie's Tucker 19, ne se nw 10-17n-7e, Bartles 2789 ft, pb 2812 ft, pump 5 bbls oil, 10 wtr, 2814 ft.
Sinclair Prairie's West 23, se nw sw 16-17n-7e, Bartles 2700-79 ft, pb 2765 ft, shot 70 qts, pump 5 bbls oil, 30 wtr, 2779 ft.
Sinclair Prairie's Billey 1, se nw se 28-18n-7e, Bartles 2583 ft, shot 50 qts 2585-2649 ft, flow 170 bbls, 2649 ft.
**Creek County—Glenn:** Gulf's Pitman 38, se nw sw 8-17n-12e, Glenn 1421 ft, input, 1573½ feet.
Sinclair Prairie's Berryhill 42, se nw nw 16-17n-12e, Glenn 1397 ft, repressure, 1563 ft.
Sinclair Prairie's Berryhill 43, c s½ s½ nw nw 16-17n-12e, Glenn 1400-05 ft, shot 150 qts 1471-1568 ft, pump 20 bbls, 1575 ft.
Sinclair Prairie's Berryhill 44, c s½ s½ ne nw 16-17n-12e, Glenn 1390-1552 ft, shot 140 qts 1453-1549 ft, pump 4 bbls 1554 ft.
Sinclair Prairie's Berryhill 45, c nw nw 16-17n-12e, Glenn 1398-1560 ft, shot 140 qts 1460-1556 ft, pump 10 bbls oil, 2 wtr, 1590 ft.
Sinclair Prairie's Berryhill 46, c ne nw 16-17n-12e, Glenn 1375-1542 ft, shot 140 qts 1444-1540 ft, pump 2 bbls oil, 4 wtr, 1555 ft.
**Garfield County—Garber:** Sinclair Prairie's Campbell 24, c s½ n½ 30-22n-3w, Hotson 1470-89 ft, 1000 gals acid, pump 60 bbls, 1492 feet.
**Kay County—Tonkawa:** Ingling and Parker's State 2, se sw ne 36-25n-1w, flow 25 bbls oil, 15 wtr, 2541 ft.
**Lincoln County—Agra:** Mid-Continental et al's Lillie 1, c se sw 29-17n-5e, Skinner 3483 ft, 650,000 gas, 3675 ft.
**Lincoln County — S. Wilzetta:** Amerada's Holik 2, se ne nw 10-12n-5e, Red Fork 3803 ft, pb 3834 ft, shot 20 qts, pump 100 bbls, 3850 ft.
**Oklahoma County—Oklahoma City:** Continental et al's Donley 1, lot 18, blk 18, 22-12n-3w, Wx 6440 ft, shot 350 qts, pump 251 bbls, 6539 ft.
**Pawnee County—Cleveland:** Sinclair Prairie's Jones 44, cnl n½ nw 20-21n-8e, Bartles 2330 ft, abnd 2418 ft.
**Pottawatomie County—W. Macomb:** Sinclair Prairie's Atwater 1, nw nw nw 33-8n-3e, Hunton 4661 ft, 2000 gals acid, flow 375 bbls, ¼-in, cut 2%, 4678 ft.
**Pottawatomie County—Shawnee:** Atlantic et al's Quinlin 1, nw ne nw 19-11n-5e, Wx 4762 ft, 200 bbls, 4782 ft.
**Seminole County — Unnamed:** Blackwell's Fleet-Osborn 3, sw se ne 12-5n-6e, bromide dense 3620 ft, abnd 3794 ft.
**Seminole County — Hazel:** Vallines' Harris Foundation 1, sw sw sw 30-7n-6e, Allen 1284-99 ft, abnd 1302 ft.
**Stephens County—Woolsey:** Fair Operating Co.'s Baker A-6, se se ne 35-2s-6w, Arb Congl 1672 ft, lime 1680 ft, flow 237 bbls, ⅜-in, 1780 ft.
**Tillman County—Red River:** Burke-Divide Oil Co.'s Guthrie 246, ne se ne 8-5s-14w, sand 1586-1620 ft, sand 1620-25 ft, pb 1644 ft, shot 150 sticks dynamite, pump 12 bbls oil, 60 wtr, 2616 ft.

### OKLAHOMA WELLS DEEPENED

**Okfuskee County—Olympic:** Sinclair Prairie's Phillips 2, se se ne 24-10n-8e, otd 1880 ft, sand 1864 ft, shot 40 qts 1880-99 ft, pump 11 bbls oil, 3 wtr.

### OKLAHOMA WILDCATS

**Cleveland County—Failure:** Law et al's Oeley 1, nw se 10-10n-1e, Oread 3525 ft, Hogs 4400 ft, Osw 5435 ft, Hunton 5765 ft, 1st Wx, 6260 ft, 2nd Wx 6377 ft, abnd 6398 ft.
**Creek County—New Field:** John J. Fleet's Adams 1, se nw 8-14n-7e, Prue sd 2860 ft, shot 25 qts 2862-74 ft, flow 127 bbls, 2874 ft.
**Stephens County—Failure:** Helmerich & Payne's Gibbhorn 1, ne ne ne 25-2n-6w, Hoxbar 4750 ft, abnd 6241 ft.

### WEST TEXAS

**Andrews County—Embar-Permian:** Phillips' University-Andrews 35, c nw se sec 31, blk 10, elev 3243 ft, flow 217 bbls, ¼ to ½-in, acid 1500 gals Clear Fork 6190-6260 ft.
**Cochran County — Slaughter:** Superior of Cal.'s Dean 7, 440 ft nsl and 2525 ft wel leag


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57, Martin CSL, flow 621 bbls cas, acid 9000 gals 4929-93 ft.

Superior of Cal.'s Dean 8, 440 ft out sec leag 57, flow 249 bbls cas, acid 14,000 gals 4910-75 ft.

**Crockett County—Clara Couch:** Bay Pet. Corp.'s Hoover-Cities Service 1, 529 ft nsl and 2005 ft ewl GC&SF 13, blk GG, east outpost, elev 2411 ft, lime 1884 ft, pump 139 bbls, 1% water, acid 2000 gals 1897-1917 ft.

**Crockett County—Soma-Noelke:** A. J. Rife and Floyd Scott's Bouscaren 1, ne ne ne TC 57, blk GG, flow 288 bbls, ½-in, shot 60 qts 1165-81 ft.

**Crockett County—World-Powell:** Trebol Oil Co.'s Powell 4, ne ne sw EL 53, blk BB, pump 105 bbls, plus 11% water, acid 1500 gals 2584-88 ft.

**Ector County—North Cowden:** Carl B. King-Bay Pet. Corp.'s Holt 1-D, c ne nw PSL 20, blk A, pump 101 bbls oil, 5 water, shot 610 qts 4361-95 ft.

Stanolind's Midland Farms 1, Unit 4, 440 ft nsl and 2052 ft ewl G&MMB&A 46, blk 42, T-1-N, pump 204 bbls oil, 8 water, shot 330 qts 4589-4701 ft, td 4822 ft, pb to 4709 ft.

**Gaines County—Wasson:** Bay Pet. Corp.'s Wasson-Humble 1, 1980 ft snl and 2130 ft ewl PSL 53, blk AX, flow 420 bbls, ⅝-in, acid 6000 gals 4915-60 ft.

**Hockley County—Slaughter:** Eugene Constantin et al's Elliott 1, 440 ft out swc lab 10, leag 42, Rains CSL, flow 282 bbls, 24/62-in, acid 8000 gals 4912-47 ft.

Eugene Constantin et al's Elliott 3, 440 ft ewl, 1320 nsl lab 10, leag 42, Rains CSL, flow 593 bbls cas, acid 6000 gals 4912-42 ft.

Falcon Co.'s Grant 3, 660 ft out nwc lab 12, leag 42, Rains CSL, flow 435 bbls, 2-in, acid 8000 gals 4905-37 ft.

L. M. Glasco et al's Mallet 14-C, 580 ft out sec lab 14, leag 48, Edwards CSL, flow 684 bbls, acid 12,000 gals 4897-4940 ft.

Magnolia's Mallet 16-F, 580 ft out nwc lab 8, leag 49, Edwards CSL, flow 1030 bbls, acid 10,500 gals 4935-5017 ft.

T. F. Morrow et al's Mallet 19, 580 ft out sec lab 19, leag 48, Edwards CSL, flow 540 bbls, 2-in, acid 12,000 gals 4900-45 ft.

T. F. Morrow et al's Mallet 20, 580 ft out nwc lab 19, leag 48, Edwards CSL, flow 469 bbls, acid 12,000 gals 4901-43 ft.

**Howard County—Iatan-East Howard:** Fleming Oil Co. et al's Jones 3, 350 ft nsl and 1650 ft wel T&P 15, blk 30, T-1-S, pump 196 bbls, shot 925 qts 2555-2889 ft.

**Pecos County—Abell:** Skelly's Spears 1, 2310 ft from se and 990 ft from sw lines H&TC 5, blk 3, pump 72 bbls, acid 500 gals, perf Waddell lime 5897-5905 ft, td 5907 ft.

**Pecos County—Apco:** General Crude Oil Co.'s Masterson 1, 542 ft from sw and 668 ft from se lines H&GN 104, blk 10, flow 1061 bbls, ½-in, Ellenburger perf 4495-4705 ft, td 4723 ft.

**Yoakum County — Wasson:** Devonian Oil Co.'s Bennett 2, c se ne sec 631, flow 673 bbls, 2-in, acid 11,000 gals 5147-5270 ft.

### WEST TEXAS WELL DEEPENED

**Ward County:** Eastland Oil Co.'s Johnson 3, 330 ft from nw and 2310 ft from ne lines H&TC 24, blk 34, otd 2936 ft, pump 55 bbls, shot 180 qts 3000-72 ft, td 3088 ft, pb to 3072 ft.

### WEST CENTRAL TEXAS

**Callahan County:** Trumter Pet. Corp.'s Slaughter 9, 660 ft nsl and 1890 ft ewl D&DA 7, abnd 401 ft.

L. A. Warren et al's Clinton 2, 520 ft nsl and 150 ft ewl lse, M. Cherry sur 4, abnd 560 ft.

**Coleman County—Coker:** H. T. Owen and H. H. Adams' Coker 3, GH&H 72, blk 2, flow 168 bbls, 24/64-in, Strawn sand 3036-50 ft.

**Jones County—Noodle Creek:** Fain-McGaha et al's Westexas O&R Corp. 1, 990 ft ewl and 330 ft snl of s-140-ac w½ T&P 15, blk 19, abnd 3209 ft.

**Shackelford County:** Roeser-Pendleton-Conoco's Cook 4-A-146, 1039 ft snl and 330 ft wel se¼ ET 146, abnd 1609 ft.

Roeser-Pendleton-Humble's Morris 8, 440 ft snl and 990 ft wel se¼ ET 205, pump 73 bbls, 1578-84 ft, td 1589 ft.

### WEST CENTRAL TEXAS WELL DEEPENED

**Coleman County:** Brannon & Murray's Dibrell 2-C, 4164 ft snl and 2137 ft wel J. W. Hicks 265, otd 1903 ft, flow 30 bbls, ¾-in, shot 15 qts 3198-3209 ft, td 3220 ft.

### WEST CENTRAL TEXAS WILDCATS

**Taylor County—Failure:** Hunter & Hunter's Bell 1, 1367 ft ewl and 660 ft snl W. W. Sills 23, elev 1749 ft, abnd 2399 ft.

### TEXAS PANHANDLE

**Gray County: Phillips'** Davidson-Myrt 1, nw nw ne H&GN 64, blk B-2, pump 229 bbls, shot 200 qts 2935-3000 ft, td 3004 ft.

**Hutchinson County:** J. M. Huber Corp.'s State-River 4, 350 ft n and 780 ft w of nwc H&TC 78, blk 46, in Canadian River, pump 59 bbls, acid 1000 gals 2630-2700 ft.

**Potter County:** U. S. Bureau of Mines' Bush 4-A, 1950 ft snl and 1680 ft ewl BS&F 23, blk 6, elev 3376 ft, 6,000,000 helium, rp 705 lbs, acid 10,000 gals 3290-3574 ft.

### NORTH TEXAS

**Archer County—Scotland:** Shell's Coleman 7-A, 2250 ft wel and 330 ft from m/s/s lines ATNCL 74, Bend 5097 ft, flow 488 bbls, ½-in, 5099-5171 ft.

**Archer County:** C. T. Hedges et al's Walsh 1, 790 ft ewl and 1320 ft nsl TE&L 2417, abnd 1401 ft.

Producers Development Co.'s Roach 17, TE&L 1595, pump 15 bbls, 1261-63 ft.

**Clay County—Joy:** Shell's Goad 1-A, 635 ft snl and 990 ft ewl blk 20, H. Williams sur, pump 140 bbls, shot 22 qts 3996-4016 ft, td 4018 ft.

**Clay County:** Geo. G. Golden et al's Roop 4, sec 10, Thornberry subdiv, abnd 1144 ft.

Texas Co.'s Dallas Bank 2, 990 ft from sw and 330 ft from se lines nw-440-ac sec 35, Jane Duncan sur, abnd 1327 ft.

**Jack County:** Phillips' Carney-Pan 1, 330 ft nsl and 2000 ft ewl C. M. Snodgrass sur, pump 51 bbls, Strawn perf 2902-11 ft, td 3300 ft, pb to 2911 ft.

**Wichita County:** Cochran & Cain's Waggoner 1-A, 1400 ft nsl and 2200 ft ewl HT&B 14, pump 15 bbls, 1868-84 ft.

Martin Properties, Inc.'s Ramming 1-A, 330 ft snl and 1510 ft wel sec 1, H. Hastie sur, pump 30 bbls, td 1255 ft.

**Young County:** Jerome McLester & Keith's Griffin 1, 330 ft snl and 660 ft ewl sec 2, J. Parham-S. P. Ry. sur, flow 75 bbls ¼-in, 3348-63 ft.

### NORTH TEXAS WELL DEEPENED

**Cooke County:** Mudge Oil Co.'s Johnson 14-A, 480 ft nsl of J. Clark sur and 600 ft w No. 13, otd 1120 ft, abnd in Ellenburger 1398-1698 ft.

### NORTH TEXAS WILDCATS

**Archer County—Failures:** Mrs. T. A. Norwood et al's Henry 1, 330 ft out nec w-144-ac of n-184 ac sec 35, blk 5, Clark-Plumb sur, abnd 1200 ft.

Louis Sikes et al's Seay 1, 990 ft ewl and 1650 ft snl blk 56, Harris Club Ranch, abnd 1405 ft.

**Clay County—Failures:** Akin-Dimock et al's Henderson 1, 990 ft snl and 2250 ft wel S. Hernandez sur A-185, abnd 1358 ft.

Sussex Oil Corp.'s Chapin 1, 330 ft snl and 990 ft ewl blk 81, Byers subdiv, abnd 1173 ft.

Sussex Oil Corp.'s Groves 1, 990 ft wel and 725 ft snl blk 87, Byers subdiv, abnd 1401 ft.

**Wichita County—Failure:** Gorman & Metzner's Parker 1, 750 ft ewl and 330 ft nsl of e-60-ac of s½ blk 22, Palo Pinto CSL sur, abnd 800 ft.

**Wilbarger County — Failure:** Consolidated Oil Co.'s Ancell 1-R-E, 675 ft snl and 688 ft ewl se H&TC 34, blk 6, K-M-A lime 3926 ft, Ellenburger 4506 ft, abnd 4528 ft.

**Wise County—Failure:** L. S. Youngblood-R. L. Foree's Berry 1, 660 ft out nwc 120-ac lse, Edward Stephens sur A-754, elev 1058 ft, Ellenburger 6354 ft, abnd 6550 ft.

**Young County—Failure:** Bridwell Oil Co.'s Daws 1-A, 934 ft ewl and 330 ft snl TE&L 764, abnd 991 ft.

### EAST TEXAS

**Wood County — Hawkins:** Humble's Scott 1-B, 425 ft s and 3190 ft w of m/e/ne cor E. Wideman sur, elev 352 ft, abnd 5042 ft.

Humble's Smith 1-D, 1690 ft ewl and 3690 ft snl Geo. Brewer sur, elev 340 ft, Woodbine 4327 ft, flow 320 bbls, ¼-in, perf 4682-4700 and 4747-54 ft, td 4790 ft.

### EAST TEXAS WILDCATS

**Franklin County—Failure:** R. T. Myers-C. D. Davis' Cox 1, 624 ft wel and 882 ft nsl 80-ac lse, blk 1, J. M. Gill sur, 5 mi n Winnsboro, elev 449 ft, Austin 3813-70 ft, Woodbine 4355 ft, Georgetown 4915-65 ft, Goodland 5925-35 ft, Paluxy 5980 ft, abnd 6110 ft.

**McLennan County—Failure:** F. G. Lippitt et al's Central Life 1, 500 ft out nec 83.77-ac lse, sec 4, University Lands, abnd 860 ft.

**Shelby County—Failure:** Paul Pewitt's Pickering 1, M. Cook sur, abnd 7304 ft.

### TEXAS GULF COAST

**Chambers County — Oyster Bayou:** Sun's Jackson 15, 1980 ft s, 240 e of nw cor A. Ybarbo Lge, set 5½-in 8390 ft, sand 8295 ft, flow 673 bbls, ¼-in, td 8390 ft.

### TEXAS GULF COAST WILDCAT

**Lee County—Failure:** Superior Oil Corp.'s Quinn 1, L. P. Rucher sur, 660 ft out of most se'ly cor of n 92-ac of 251-ac tr, Giddings area, abnd 3519 ft.

### LOWER TEXAS COAST

**Bee County—South Caesar:** Seaboard's Slick 2, 500 ft fr wl, 1843 fr sl of blk 36, P. B. Butler subdvn on 118-ac lse Medio Ranch, E. Stapp sur, 5½-in 6588 ft, perf 6578-83 ft, flow 195 bbls, ⅛-in, td 6588 ft.

**Jackson County—West Mauritz:** John B. Coffee's Westhoff & McCrory 1-A, 467 ft fr el & 470 ft fr sl of n 80-ac of e 160 of w½ M. L. York sur 22, 5½-in 5610 t, perf 5454-65 ft, flow 100 bbls, ⅛-in, td 5612 ft.

**Jackson County—Ganado:** Texas Co.'s Hultquist 1, 660 ft fr s&wl's 167-ac tr in s'ly sw cor Morris-Cummings sur 8, 5½-in 6563 ft, perf 6450-57 ft, flow 132 bbls, ⅛-in, td 6563 ft.

**Jackson County—Mayo:** Walter Van Norman's McCrory 2, 467 ft fr n&wl's of n 140-ac of 232-ac tr in M. L. York sur 12, 5½-in 5446 ft, perf 5438-45 ft, flow 128 bbls, ⅛-in, td 5446 ft.

**Jim Wells County — Seeligson:** Magnolia's Seeligson 42, 660 ft fr s, 16,940 ft fr el of A. Ramirez grant, 7-in 6572 ft, perf 5209-12 ft, flow 108 bbls, 7/64-in, td 7000 ft.

Premont Development Co.'s Garcia 1, 640 ft fr wl, 910 fr nl of drilling block 3, 51-ac tr in sec 46, BS&F sur 361, abnd 7510 ft.

**Jim Wells County — Armagosa:** Smith &


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Story's McGill 5, 1107 ft fr nl, 2050 ft fr el of George W. Clark sur, 285-ac part of 2085-ac tr, set 5½-in 2744 ft, perf 2725-28 ft, flow 9,250,000 gas, 2-in tubing, td 2744 ft.

**Live Oak County—Mountain View:** B. F. Hurlbut's Riser 1, 467 ft fr s&wl's blk 2, A. Moore sur 382, abnd 2160 ft.

**Nueces County—Richard King:** Abott & Traxler's Morgan 1, 495 ft fr sl & 1791 ft fr el of 240-ac lse, sec 3 & 5 of Richard King Farm Lots of Casa Blanca gr, abnd 5834 ft.

**San Patricio County — Midway:** British-American's McAngus 1, 467 ft fr el, 330 ft fr nel 220-ac tr, nw¼ sec 71, 5½-in 6169 ft, perf 6079-85 ft, flow 140 bbls, ⅛-in, td 6616 ft.

**San Patricio County—Rooke:** Plymouth's Welder 4-E, 660 ft fr nl, 3300 ft fr wl of sec 44, Welder Ranch subdvn, 5½-in 7168 ft, perf 7164-68 ft, flow 42 bbls, 3/32-in, td 7168 ft.

### LOWER TEXAS COAST EXTENSIONS

**Calhoun County—Jay Welder (Duck Bay):** Stanolind's Welder 7-B, 330 ft s of s shore Goose Bay (tract 153, state lands) in Eusebio Hidalgo gr, tr 10, blk E, 5½-in 5651 ft, perf 5648-49 ft, flow 152 bbls, ⅛-in, td 5651 ft, extends production southwest.

**Jackson County—Ganado:** Texas Co.'s Silliman 1, 660 ft fr sl, 553 fr el of tr 2, Morris & Cummings sur 3, 5½-in 5700 ft, perf 5092-5106 ft, pump 22 bbls, td 6658 ft, extends production southwest.

### LOWER TEXAS COAST WILDCAT

**Hidalgo County—Failure:** Sun's D. D. Oil 1, 1980 ft fr n&wl's sec 23 of G. O. Newman subdvn, El Benadito gr on 3622-ac lse, abnd 7503 ft.

### SOUTHWEST TEXAS

**Webb County—Dulup:** George Buck's Puig Bros. 2, 330 ft fr s&wl of blk 2, Edgington Mineral subdvn, Albercas de Arriba gr, 40-ac lse, set 5½-in 1815½ ft, sand 1815 ft, pump 125 bbls, td 1822 ft.

### SOUTHWEST TEXAS EXTENSION

**Starr County—North Sun:** Sun's Laurel 2, 500 ft fr el, 660 fr sl of 2295-ac lse, La Sal Colorado gr, sand 4547 ft, 5½-in 4586 ft, perf 4548-51 ft, flow 135 bbls, 9/64-in, td 5108 ft.

### SOUTHWEST TEXAS WILDCATS

**Duval County—Failure:** Stanolind's Driscoll 1, 4337 ft nw'ly alg wl fr sw cor 2800-ac lse, thence 2760 ft ne'ly at ra, TNO 5, abnd 5259 ft.

**Jim Hogg County—Failure:** M. L. Massingill and Highland Oil Co.'s Armstrong 1, Gutierrez area, 1650 ft fr n&el of A. Villa sur 90, abnd 3664 ft.

**Starr County — Discovery:** Dee Davenport and Lockhart Oil Co.'s Caffarelli 1, 660 ft fr s&wl's share 19-C, J. A. de la Garza Falcon porcion 80, 1158-ac lse, 4 mi ne Los Olmos field, 5½-in 3609 ft, sand 3620 ft, flow 77 bbls, ⅛-in, 46.6-gr, sand 3620 ft, td 3630 ft, opens field.

### SOUTH CENTRAL TEXAS

**Caldwell County—Bee Creek:** Ralph R. Ogden's Moore 2, 330 ft fr nwl, 990 fr nel 305-ac lse, Jasper Gilbert sur, abnd 2306 ft.

### SOUTH CENTRAL TEXAS WILDCATS

**Caldwell County—Failure:** John A. Deering's Adams 1, 1890 ft fr nel, 660 fr sel of 220-ac lse, 3 mi sw Lockhart, abnd 2072 ft.

**Guadalupe County—Failure:** Leigh J. Sessions' Mattke 1, 1150 ft fr nwl, 910 fr swl Y. P. Alsbury sur 135, 6 mi se New Berlin, abnd 2690 ft.

**Williamson County—Failure:** H. C. LeFors' Schmidt 1, 660 ft fr el, 880 fr sl of 197-ac lse, Margaret Daniel sur 101, abnd 752 ft.

# United States Wildcat Starts

### ARKANSAS

**Calhoun County:** Placid Oil Co.'s Freeman-Smith 5, nw se 14-16s-13w, dr.

Placid's Freeman-Smith 6, nw nw 14-15s-14w, mim.

Placid's Freeman-Smith 7, nw ne 2-15s-14w, lcn.

**Columbia County:** McAlester-Southwood et al's Staggs 1, nw sw 10-16s-20w, woc.

**Johnson County:** Arkansas-Louisiana Gas Co.'s Hendrix 1, se 21-10n-21w, dr.

**Miller County:** Magnolia's Olivet A-9, ne ne 4-16s-26w, dr.

**Union County:** Schmidt, Tr.'s Kelly 1, ne se 9-17s-14w, dr.

Sam Richardson's Graves 1, ne se 17-17s-14w, spud.

B.S.J. Corp.'s Jerry A-1, s½ se sw 21-17s-14w, woc.

Arkhill Oil Co.'s Union 1, sw sw sw 18-18s-13w, woc.

### CALIFORNIA

**Kern County:** Albert Stevenson's Bowerbank 1, nw se se 5-29-24, Bowerbank area, lcn.

C. C. M. O. Co.'s G-22-27, 27-31-22, Midway Northwest area, rig.

**San Joaquin County:** Bankline Oil Co.'s 3-1, sw se ne 5-4-7, lcn.

### ILLINOIS

**Christian County:** Central Illinois Oil Co.'s Zimmerman 1, sw sw sw 36-11n-2w, lcn.

**Clinton County:** Gulf's S. Watts 1, sw sw sw 28-3n-1w, lcn.

**Cumberland County:** Kingwood's Massie 1, c sw sw 12-9n-8e, lcn.

**Edwards County:** N. V. Duncan's Wirth 1, nw sw nw 23-2s-14w, lcn.

**Franklin County:** J. W. Menhall's Kirkpatrick 1, sw sw se 35-5s-1e, lcn.

Ohio's U. S. Coal and Coke 1, ne ne nw 13-6s-3e, lcn.

**Wabash County:** C. E. Skiles' Zimmerman 1, nw ne se 36-1n-13w, lcn.

**White County:** R. W. Slemaker's Ackermon 1, nw nw ne 21-5s-10e, lcn.

W. C. McBride's Bailey 1, sw se 3-7s-9e, lcn.

### KANSAS

**Edwards County:** Eason Oil Co.'s Ploger 1, nwc sw 9-23s-19w, mim.

Broderick & Gordon's Wolfe 1, sec 11-24s-18w, dk.

**Harvey County:** Falcon Seaboard and Drillers Gas Co.'s Neufeldt 1, c nw se 15-22s-3w, dk.

**Phillips County:** E. C. Harvey & Calhoun's Harvey 1, c se ne 16-5s-20w, surf pipe.

**Rooks County:** Charles M. Coats & Mousler Drlg.'s Tom Moore 1, c se nw 10-7s-17w, ru.

**Russell County:** Falcon Seaboard's Heinze 1, c sw sw 20-14s-11w, lcn.

**Stafford County:** Helmerich & Payne's Vincent 1, c e½ ne ne 5-24s-11w, c&p.

Stanolind's Hart 1-A, c ne ne 28-25s-15w, mim.

### NORTH LOUISIANA

**Bienville Parish:** Placid Oil Co.'s Southern-Advance-Hodge Hunt 1, sw ne 16-15n-6w, dr.

**Bossier Parish:** White & Hinton's Louisiana 1, sw ne 16-23n-12w, lcn.

C. W. Beene's Fenet 1, nw se nw 25-21n-14w, dr.

Harry I. Morgan's Bolinger 1, lot 18, section 38-23n-11w, mim.

**Caldwell Parish:** T. L. Sessions et al Louisiana 1, ne ne 27-12n-3e, lcn.

Youngblood-Foree Co.'s Louisiana 1, se se 18-14n-3e, lcn.

**Catahoula Parish:** Roy L. Fisher et al's Rhone 1, sw sw 6-6n-7e, dr.

Sinclair Prairie's State 1, nw se 30-9n-7e, mim.

**Concordia Parish:** California Co.'s Pan-American 1, sw 4-9n-10e, dr.

**DeSoto Parish:** Oakes-Easton et al's Ramsey 1, nw sw 27-13n-16w, dr.

**Franklin Parish:** C. H. Murphy Jr.'s D. Robinson et al 1, sw nw 21-13n-7e, lcn.

Sohio's Splane 1, ne ne 34-12n-8e, dr.

**Morehouse Parish:** Sohio's Carter 1, 34-19n-6e, lcn.

**Red River Parish:** Cryer & Reese Adams 1, 27-12n-9w, lcn.

**Vernon Parish:** W. S. Smith's Nona Mills 1, 31-3n-11w, dr.

### MICHIGAN

**Clare County:** Gulf's State 1, s½ se sw 13-24n-1w, lcn.

**Allegan County:** W. S. Cook's Dyer 1, ne ne ne 2-2n-14w, rig.

C. J. Smith's Howard 1, ne ne ne 24-4n-13w, lcn.

**Mecosta County:** Sun's McCormack 1, s½ se se 23-16n-8w, lcn.

**Van Buren County:** Homrich & Kendall's Spinder 1, sw se nw 12-2s-17w, rig.

### NEW MEXICO

**Lea County: Neil H. Wills et al's Flint 1,** c ne ne 30-20s-34e, lcn.

### OKLAHOMA

**Cleveland County:** H. L. Berkley et al's Shultz 1, c ne ne 5-10n-1w, c&p.

**Logan County:** Eason Oil Co. et al's Cather 1, ne nw nw 15-16n-2w, lcn.

**Washita County:** Gulf's Perkins 1, c se sw 31-8n-17w, c&p.

### TEXAS GULF COAST

**Matagorda County:** Brewster-Bartle's Fuller-Nelson 1, Bay City area, 466 ft e at ra fr GC&SF RR in I&GN surveys 1 & 2, blk 5, preparing spud 8500-ft test.

### LOWER TEXAS COAST

**Bee County:** Bridwell Oil Co.'s R. V. St. John 1, 330 ft fr se & swl 32-ac tr, Beeville townsite, J. Hefferman sur, spudding Vicksburg test.

**Goliad County:** Sun's Heard 1, 3000 ft n of sl Robert Walker sur & 1000 ft e wl of 1193-ac tr, lcn.

**Jim Wells County:** Humble's San Antonio

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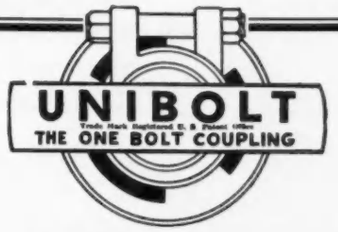


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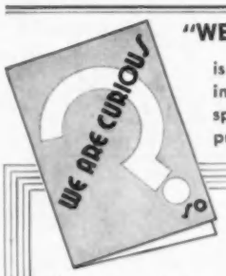


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Joint Stock Bank 1, 595 ft fr s, 732 ft fr wl 525-ac lse, Marcelline Lopez gr, lcn 6250 ft test.

**Kenedy County:** Humble's McGill 1, 7260 ft fr s'ly el & 5940 ft fr sl of McGill Ranch in GC&SF 67, lcn 7500-ft test.

**Refugio County:** P. R. Rutherford's Huff 1, 342 ft fr sw, 330 ft fr sel of 71-ac lse, Edward Perry sur, 1½ mi se Inari, rigging up.

**San Patricio County:** Kilgore Developers' Dix 1, 500 ft fr ne&nwl of 80-ac lse, Juan de la Garza sur, 6 mi e Mathis, lcn 6000-ft test.

### SOUTHWEST TEXAS

**LaSalle County:** Progress' Zuehl 1, 330 ft fr e, 1320 ft fr wl 320-ac tr, D. M. Murphy sur, lcn 6000-ft Wilcox test.

**Live Oak County:** Continental's West 2, lot 65, blk 35, Kittie subdvn of George West Ranch, 2 mi sw Oakville, Michael Caronican sur A-135, lcn.

**Live Oak County:** Henderson Coquat's Coquat 1, J. Poitevent sur, lcn 7500-ft test.

**Starr County:** W. L. Goldston's Gutierrez 1, share 44-B, porc 88, 10 mi ne Rio Grande City, lcn 4000-ft test.

**Webb County:** O. W. Killam's Yeager-Strohman 1, 330 ft fr w & 467 ft fr nl 100-ac lse share 6, Las Animas gr, lcn 3500-ft test.

**Duval County:** Texon Royalty & R. H. Hawn's Benavides 1, 466 ft fr ne&sel blk 25, Mesquite Oil & S. J. Carpenter subdvn of El Mesquite gr, 7½ mi e Bruni, lcn 3500-ft test.

### NORTH TEXAS

**Archer County:** A. R. Dillard-Frank Wood et al's Albright 1, se nw se sec 4, Hooper & Wade sur, 3¾ mi se Dundee, lcn Ellenburger test.

**Cooke County:** W. T. Lucas and F. W. Lausen's Rosson 1, 330 ft nsl and 1522 ft ewl 380-ac tr, BBB&C 19, A-146, lcn 2000-ft test.

Fred Snuggs-McElreath-Suggett & Seitz-Comegys & Seitz, Inc.'s McGeorge 1, 1319 ft ewl and 1386 ft nsl sec 64, Fannin CSL sur, lcn 6000-ft test.

**Jack County:** Standard of Texas-Hanlon-Buchanan's Carter 2, 567 ft wel and 1206 ft nsl TE&L 3304, lcn.

**Montague County:** Stanolind's Reed 1, 660 ft out swc blk 48, J. H. Belcher subdiv, 3½ mi w Nocona, lcn 6000-ft test.

**Young County:** Bridwell Oil Co.'s Hulse 1-A, 330 ft snl and 1167 ft ewl TE&L 767, lcn 2000-ft test.

Roy Horany et al's Gadberry 1, 330 ft out nec TE&L 227, lcn 1000-ft test.

W. R. Stipe et al's Schlegel 1, 900 ft snl and 750 ft ewl TE&L 79, lcn 1150-ft test.

Mudge Oil Co.'s Davidson 1, 467 ft out sec TE&L 272, lcn 5000-ft test.

### EAST TEXAS

**Smith County:** B. F. Phillips et al's T. R. Collier 1, 660 ft out nwc 132-ac lse, John Lovett sur, lcn Woodbine test.

**Panola County:** Continental Oil Co.'s Werner 1, Palmer sur, 7000 ft test, dk.

Union Producing Co.'s Black 1, Black sur, 6500 ft test, dr.

### WEST TEXAS

**Fisher County:** Humble's Willingham 1, c ne ne H&TC 43, blk 3, lcn Ellenburger test.

**Pecos County:** Gulf's Girvin 1, c nw sw H&GN 60, blk 11, lcn Ellenburger test.

### WEST CENTRAL TEXAS

**Callahan County:** Homer Beasley et al's Hatchett 1, sw nw nw D&DA 22, lcn 4100-ft test.

**Shackelford County:** R. H. Roark et al's Todd 2, se ne sw BAL 11, lcn 1000-ft test.

# Squeaks from the Bull Wheel

### Army Routine

The inductee was all set except for a final examination of his eyes, and following instructions presented himself at a designated room. He was greeted by a sergeant who, without letting him explain his mission, told him to "get in there, take off your clothes and wait!" After waiting all afternoon and not being reached, the draftee was instructed to be back in the morning at eight, "and," the sergeant said, "we don't mean maybe."

Again the next day he was not allowed to explain about his eyes and again was told to strip and wait.

Seeking sympathy from a fellow sufferer who also seemed disconsolate, he remarked, "I don't see why I have to hang around here naked all week just to get my eyes examined."

"How about me," the other victim answered, "I just came over here to deliver a telegram."

### Opposites

"They say people with opposite characteristics make the happiest marriages."

"Yes, that's why I'm looking for a girl with money."

### Gee Whiz!

"How much is this diamond," said the Happy Young Man.

"$100," said the Jeweler.

The Young Man looked startled and whistled. He pointed to another one: "And this one?"

"Two whistles."

### Self Defense

"When I was your age, young lady, a nice girl would never think of holding a young man's hand."

"But mother, nowadays, a nice girl has to hold a man's hand."

### Knows All the Answers

"Is the boss in?"

"Are you a salesman, bill collector, or a friend of his?"

"All three."

"He's in a business conference. He's out of town. Step in and see him."

### Easy

"Tell me how you and your wife have lived so happily together all these years."

"Simple enough. She goes her way and so do I."

### Also Through Arkansas

An American soldier in England was giving some illustrations of the size of his country.

"You can board a train in Texas at dawn and 24 hours later you'll still be in Texas."

"Yes," said one of his listeners, "we've got trains like that here, too."

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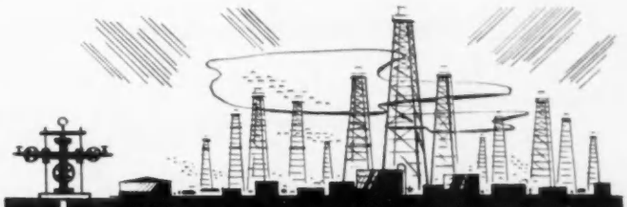

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*Export Office:* 74 Trinity Place, New York City

# Notes for the Equipment Buyer and User

### Foote Brothers Corporation Awarded Army-Navy E

Foote Brothers Gear and Machine Corporation, Chicago, has been awarded the Army-Navy E for excellence in production of wartime equipment. H. Mansfield Horner, vice president of United Aircraft Corporation and general manager of Pratt & Whitney Engine Division, was master of ceremonies at the presentation, and Rear Admiral Clark H. Woodward presented the pennant which was received by Wm. A. Barr, president of the company. Colonel Wm. A. McCarty presented the E pin which was received by Joseph D. Persily representing the employes of Foote Brothers.

### Bethlehem Appoints West Coast Distributor

Bethlehem Supply Company announces the appointment of Petroleum Equipment Company, Los Angeles, as its Pacific Coast distributor of Bethlehem pumping units.

### National Supply Sales Up During First Quarter

Sales of the National Supply Company for the first quarter of the year were approximately $35,000,000.00, an increase of about 67 percent over sales for the same period in 1942, A. E. Walker, president, reported to the annual meeting of stock holders recently.

Superior Engine Division of The National Supply Company officials and representatives at the annual sales meeting, held in Springfield, Ohio. The meeting was directly in charge of Arch F. Campbell, sales manager of Superior Engine Division, under the supervision of S. W. McKinney, vice president in charge of sales, The National Supply Company. New developments indicated by the proving ground of war were discussed and plans formulated for presentation of the company's products in the post-war market.

Walker revealed that increased volume has reduced the cost of war materials for the Army and Navy to such an extent that the company has made numerous voluntary reductions in price and will continue to pass on to the government the benefit of reduced cost after a normal margin of profit.

Clark Bros. Company, Olean, New York, was recently awarded the Army-Navy E, presentation ceremonies being held in the Olean Armory, with John B. Kennedy, radio commentator, presiding. Lieutenant Colonel Ernest W. Ogram spoke for the Army and Commander R. G. Walling, for the Navy. Acceptance of the award was by C. Paul Clark, president of the company. E Pins were accepted by Stephen Rice, Sr., Coletta E. Keeny and Timothy M. O'Brien. Stephen J. Rich, Sr., concluded the program with an acceptance address on behalf of the employes. Holding the flag in the picture are, left to right, Clark, Colonel Ogram, Kennedy, Commander Walling and Rich.

### Houston Nomad Chapter Holds Regular Monthly Meet

Warren L. Baker, editor of THE OIL WEEKLY, was the principal speaker at the April 13 meeting of Houston Chapter of Nomads.

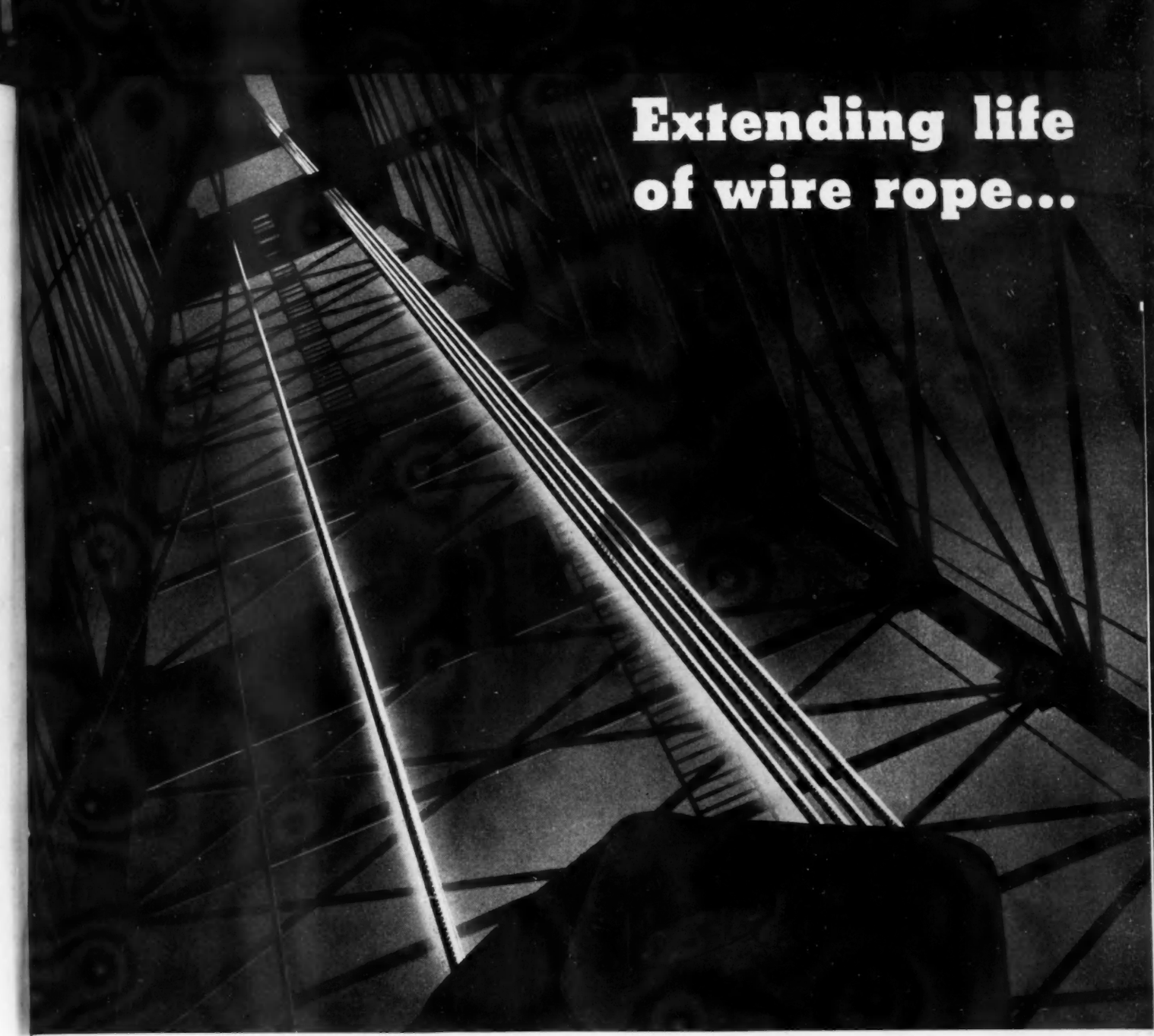
Several foreign guests were in attendance, including T. J. Walne, Neil & Massey Company, Limited, Port-of-Spain, Trinidad, and Walter Wells, Consolidated Oils, Limited, Venezuela. Other guests included J. C. Ballagh, Patterson-Ballagh Corporation, California; Wm. Alliger, manufacturers' representative, Houston, and R. Hoesbein, M. H. Detrick Company, Chicago.

### Army-Navy E Awarded to American Cast Iron Pipe

American Cast Iron Pipe Company, Birmingham, Alabama, has been awarded the Army-Navy E. The award was made by Colonel Ernest C. Bomar, District Chief, Birmingham Ordnance District, and accepted by W. D. Moore, president of the company. Don C. Williams, member of the Board of Operatives, accepted the award pins for white employes, and Norman Randall, member of the Auxiliary Board, for negro employes.

### Safety Clothing

The Strauss Company, 941 Ewart Building, 925 Liberty Avenue, Pittsburgh, has issued Bulletin 143 describing its line of head and body protection for men and women industrial workers. The literature includes "protector" helmets for both men and women, welders' helmets, rain and storm capes, and a new line of safety hats and breast protectors for factory women.



# Extending life of wire rope...

*Information supplied by "The Oil Weekly"*

The proper maintenance of wire rope is no longer a matter of debatable economics. It is a matter of sheer necessity. Good wire rope is just as hard to replace as it is vital to drilling operations.

The following suggestions are offered in the interest of longer rope service:

1. Use the type and size of rope best fitted for line speed and load conditions.
2. Keep rope in the clear between sheaves.
3. Keep rope thoroughly lubricated.
4. Insure proper spooling on drum, and prevent cross winding.
5. Use sheaves of proper diameter (40-50 times rope diameter).
6. Keep sheave grooves smooth, and sheaves in correct alignment.
7. Prevent rope from twisting, kinking, or jumping sheaves.
8. Avoid overheating, and afford protection from steam, acid fumes, or excessive moisture.
9. Keep rope free from dirt or grit by frequent cleaning.
10. Inspect rope frequently for signs of undue wear or for broken wires.

There is a simple and effective means of making rope safer to handle that also adds to its serviceability. This consists of brazing the rope back for an inch or two with an oxyacetylene torch and bronze welding wire. Sharp wire ends are covered up, and the end of the rope is prevented from unraveling.

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# Men in the Industry's News

**WILLIAM EMBRY WRATHER** has been appointed director of the United States Geological Survey, by President Roosevelt. The appointment is now awaiting confirmation by the Senate. Wrather succeeds Dr. Walter C. Mendenhall who retired in February, after 48 years of service in the Survey. The President's nominee was sponsored by a number of outstanding geologists and scientific organizations, including a committee of the National Academy of Sciences.

Wrather was born at Brandenburg, Kentucky, in 1883. He has been a professional geologist in the petroleum field, but also has a wide reputation as an authority in general geology. For a number of years he has been associate chief of the metals and minerals division of the Board of Economic Warfare.

**MELVILLE W. FULLER** has been appointed chief geologist of The Carter Oil Company with headquarters at Tulsa. He was formerly Eastern Division geologist at Mattoon, Illinois. He graduated from the University of Illinois with A.B. and M.A. degrees in geology, 1934, and has been associated with The Carter Oil Company since that time. His appointment relieves Harold F. Moses whose administrative duties as manager of the exploration department, as well as a director of the company, require that he give up the assignment as chief geologist. Lee C. Lamar succeeds Fuller as geologist for the Eastern Division at Mattoon. He has been with the company since 1932, and holds a B.S. degree in geology from the University of Oklahoma. Recently he has been district geologist at Mt. Pleasant, Michigan.

**J. K. HUFENDICK** has been transferred from Southern Oklahoma district, to Tulsa, as production superintendent for Oklahoma, by The Texas Company. He received a degree of petroleum engineering from Texas University in 1928, and has been actively engaged in oil production since, having worked in Mexico, South America, and the Mid-Continent.

**THOMAS W. DINLOCKER** has been elected vice president and treasurer of S-K-F Industries; Richard H. DeMott, vice president in charge of sales, and C. P. Collins, secretary. William L. Batt, vice chairman of WPB, retains the presidency.

**ROBERT K. KULP** has been appointed director of research by Jessop Steel Company, Washington, Pa. He was formerly associated with the Steel and Tube Division of Timken Roller Bearing Company, as research metallurgist, and previous to that, with Lukens Steel Company, in the same capacity.

**J. M. LINEHAN,** general superintendent of the pipe line division of Mid-Continent Petroleum Corporation, has been made general manager of pipe lines.

**H. FRANK JOHNSON,** civil engineer and head warehouseman for Continental Oil Company in West Texas, has resigned to become a consulting engineer with headquarters at Midland.

**A. N. HENDRICKSON,** former vice president of Landreth Production Corporation and now operating in West Texas, has been elected mayor of Midland.

**HIRAM E. CASSIDY** has been elected to the chairmanship of the Board of Governors of the Southern California Chapter of the American Association of Advertising Agencies. He is vice-president of McCarty Company, and has been associated with the company for 15 years.

**JOHN R. MILLER** has joined the editorial staff of THE OIL WEEKLY as district news representative, working out of the Mid-Continent district office at Tulsa. His previous journalistic connection was with *The Daily Journal-Gazette* at Mattoon, Illinois, as oil writer, his duties covering reporting on field activities, including development in Illinois, Indiana and Kentucky. His headquarters will be at 1302 Hunt Building in Tulsa.

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